# NATURE MAGAZINE

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# NATURE MAGAZINE

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To Stimulate Public Interest in Every Phase of Nature and the Out-Of-Doors, and Devoted to the Practical Conservation of the Great Natural Resources of America

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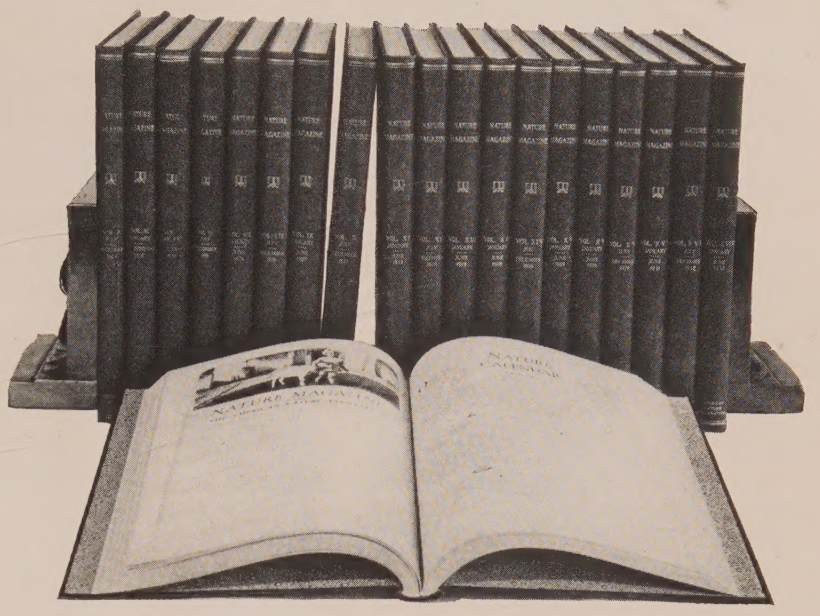

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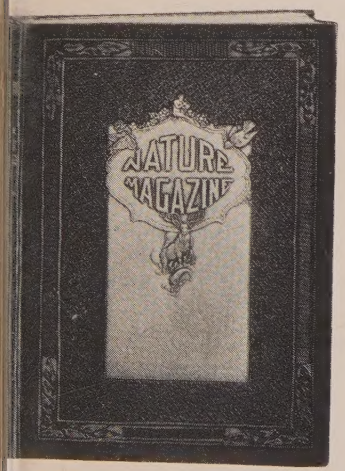


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# Photographic Notes

BY SAMUEL BROWN

## Insects

With summer in full swing, the Nature lover will find many opportunities to use his camera. A tramp in the woods will result in the location of a host of subjects—wild flowers, birds and their families, new ferns and insects galore. Insects are particularly fascinating subjects, and easily photographed with simple equipment.

In insect photography, it is desirable to focus on a ground glass and snap as soon as the subject is in the proper position. One of the best types of cameras for this is one of the reflex type. With these the insect may be focused sharply and watched, and the shutter instantly snapped. Since a picture of these subjects must be fairly large and sharp, it is desirable to work close to the object. Cameras that cannot be operated at a short distance should have one of the close-working attachments fitted. These are generally known as a proxar or portrait lens and are quite inexpensive.

Film pack and plate cameras may be utilized if they have a double extension bellows. The procedure is somewhat different from that employed with a reflex camera. Here a definite spot is chosen and focused on. The film is put in place, the slide drawn and the shutter set. After everything is in readiness, the subject is posed in the proper spot, the hand quickly withdrawn and the shutter snapped. This method can be used only with slow-moving insects. If the subject is active, it may often be tired out by repeatedly recapturing it until the insect stays long enough to photograph.

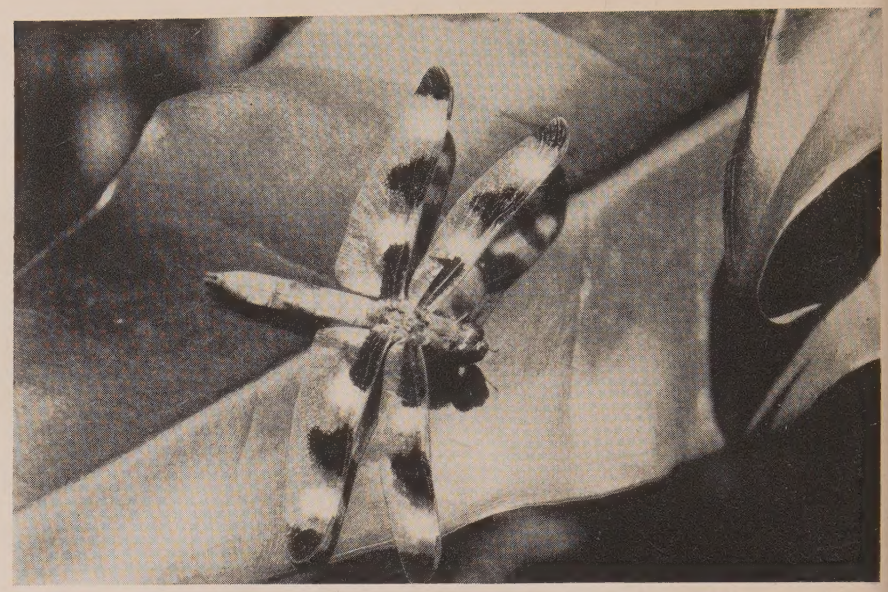
Pictures of insects should be made in good light so that fast shutter speeds can be used. Where this is impossible, it is feasible to use one or two pocket mirrors to reflect light to the proper position.

The most valuable pictures are those showing action such as the subject engaged in feeding, capturing prey, in flight, etc. Photographs of this type should be taken at fast shutter speeds since the subjects generally move rapidly during these activities. On the other hand, life history pictures such as the eggs, larvae, etc. are easily photographed and may be taken with longer shutter speeds and small diaphragm openings to give good depth of focus.

One important thing to remember is that a picture of an insect, or any other Nature subject, should be taken in its natural surroundings so as not to seem out of place. The background should not distract from the main subjects and the latter should contrast sufficiently with the background in order to accentuate them.

Many insects are brilliantly colored so it is advisable to use panchromatic films whenever possible. If the light permits, a fine grain emulsion is to be desired in order to allow extreme enlargement. To give perfect color value a light yellow filter should be used if possible. Be sure to increase the exposure to compensate for the filter factor.

The photography of insects is a fascinating activity that calls for considerable patience and skill. Invariably, any effort expended in the taking of these pictures is amply repaid by the results obtained.



THIS PHOTOGRAPH OF A DRAGONFLY ON A LEAF WAS TAKEN IN STRONG SUNLIGHT ON SUPER-SENSITIVE PANCHROMATIC FILM AT F.8 AND 1/100 OF A SECOND

* * *

## Filters

A discussion of color filters must begin with a brief explanation of light and the nature of color.

White light, as we see it, consists of rays of various colors. This can be proved by passing white light through a prism which will break it up into a band of colors. This is known as the spectrum and is always the same. An analysis will show that the spectrum begins with blue-violet which is followed by blue-green, green, orange, yellow and red. The lower or blue end of the spectrum follows the invisible ultra-violet rays while the red side is followed by the invisible infra-red rays.

Black and white photography depends on the ability of the film to register colors in their corresponding monochrome values. If we examine the spectrum we note that the brightest visible color is yellow, and brightness value falls off on each side. Even modern day films do not register colors in their real values, so we use a piece of colored glass or gelatin in front of the lens in order to filter out certain rays and give what is known as full color correction.

TAKEN ON PANATOMIC FILM WITH A NATIONAL GRAFLEX AT F.11, 1/30 OF A SECOND

Any object appears colored because it absorbs some colors and reflects or transmits others. White light can be divided into three primary colors—blue-violet, green and red. Thus a red object is one that absorbs blue-violet and green; a green object is one which absorbs blue-violet and red; and a blue object absorbs green and red. All objects reflect only the rays of their own color. If we were to examine a colored object in light that does not contain rays of that color, the object would appear black.

If films were made that could render colors in their corresponding monochrome values, it would be unnecessary to use filters except for special effects. However, present day films are oversensitive to some regions of the spectrum and not enough sensitive to others, so filters are used to correct the values that are lacking.

Let us briefly review the emulsions that are available today. Orthochromatic films include Plenachrome and Verichrome and are sensitive to ultra-violet, blue, green, yellow and orange. Their sensitivity to ultra-violet and blue, however, is somewhat too high. Panchromatic films, which include such emulsions as Panatomic, Superpan and Finopan, have the same general sensitivity as the orthochromatic film but include, in addition, the red side of the spectrum. Their sensitivity to ultra-violet and blue is still too great to be absolutely correct. They are also slightly overcorrected for red.

Obviously the most troublesome color of the spectrum is blue, so we must find a filter that will absorb some of these rays and pass all the rest. Yellow consists of all colors with the exception of blue or, to put it differently, yellow is white minus blue. Therefore, if we make a filter that is yellow in color and place it over the lens when we take a picture, some of the blue rays will be absorbed and the picture will have been corrected for the blue end of the spectrum.

(Continued in August.)

* * *

## Trade Hints and New Books

*Capturing the Jungle with Camera and Spear* is a new booklet recently published by the Folmer Graflex Corp. It is rich in

wildlife pictures taken by the author, Sasha A. Siemel, the only white man who hunts tigers with a spear. This is a real thrilling adventure story and in addition offers many useful suggestions for photographing wild animals, developing and printing in the tropics and hunting tigers with a spear—if you are interested. Send a stamped, self-addressed envelope plus a two-cent stamp to this department for your copy.

* * *

*Filmo Topics,* a periodical devoted to amateur motion picture photography and published by the Bell & Howell Co., 1842 Larchmont Ave., Chicago, Ill., has been restyled. The first issue contains several very helpful articles and future issues promise to be just as good. Bell & Howell offer to place any NATURE reader interested in this periodical on their mailing list without charge. Merely send, together with your request, a statement of the camera and projector owned and, if this equipment is of Bell & Howell manufacture, the serial numbers. This department enthusiastically recommends this magazine.

* * *

Two new big catalogues issued by Burke & James, Inc., 223 W. Madison St., Chicago, Ill., have come to hand. A review shows many excellent bargains and anyone interested in the purchase of new equipment should send to the above organization for these books. Be sure to mention NATURE MAGAZINE.

* * *

The May issue of *Leica Photography,* published by E. Leitz, 730 Fifth Ave., New York, N. Y., appears in a new dress. The front and back covers, printed in color, are reproductions of Ivan Dmitri's pictures taken on a recent trip to South America. Send for a sample copy—it's free.

* * *

*Emphasis in Pictures* by Nicholas Ház. Romo Publishing Co., Canton, Ohio. Price $2.00.

Nicholas Ház, well known pictorialist, has written a book analyzing composition. Proceeding in a remarkably logical and well planned manner, each point is carefully described and, without realizing it, one is led into a clear and definite understanding of composition. Beginning with only a spot, the twelve basic inevitable differences in a picture area containing the spot are brought out and this is followed by a description of seven further differences which are not inevitable. In eleven chapters, the many phases or elements of composition are described. Sketches illustrate each point while several outstanding photographs showing excellent examples of composition make the book doubly attractive. We recommend *Emphasis in Pictures.*

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*Champlin on Fine Grain* by Harry Champlin. Published by Camera Craft Publishing Co., 425 Bush St., San Francisco, Calif. Price $1.75.

When Harry Champlin published a series of articles in *Camera Craft* on fine grain development, he introduced a new departure that has created considerable comment and interest. In this new book of Mr. Champlin's, he gives the results of his findings. New fine grain developing formulas and higher emulsion speeds are two of the many features. Careful application of the principles outlined will result in fine grain negatives with beautiful gradation. This writer has tried some of the suggestions and was surprised at the results obtained. Add this book to your library!

* * *

Fred P. Peel, F. R. P. S., in his new book, *Shadowless Figure Portraiture,* outlines some of the principles that have made him an outstanding figure in the world of photography today. The several chapters give many hints on shadowless lighting, the photographer and his model and composition. A pictorial section of 61 pictures shows the remarkable results that are possible. If you are interested in portraiture, you need this book. Published by the Galleon Press, 175 Fifth Ave., New York, N. Y. Price $2.75.

(Continued on page 55)

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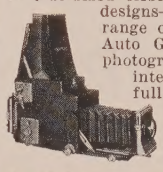

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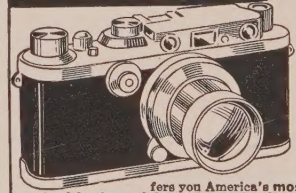

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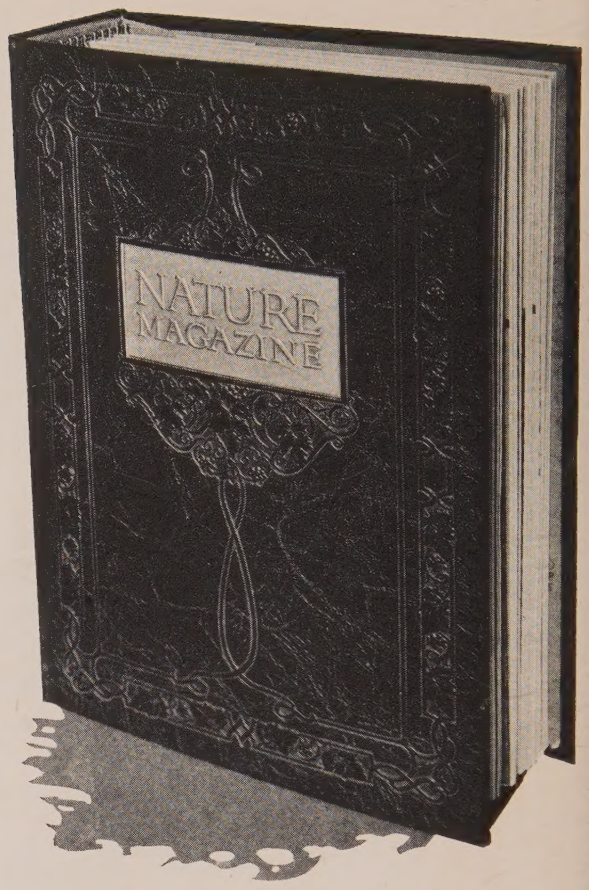


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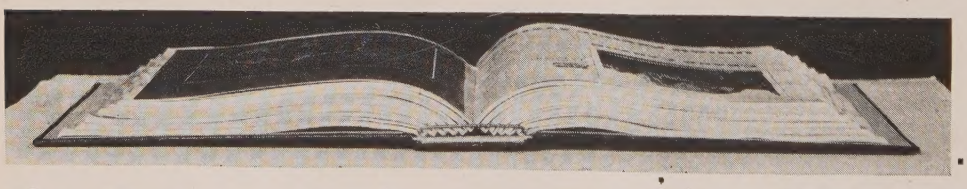

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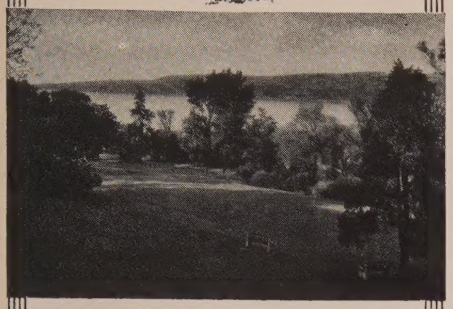

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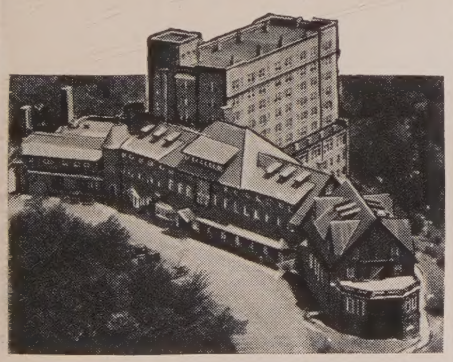

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# In July—William Brewster

*By* HOWARD ZAHNISER

A GOOD book on the out-of-doors affects Nature lovers much as the elephant is fabled to have impressed the group of blind men. William Brewster's *October Farm* has been out of the Harvard Press only a short time, though long enough for its deserved audience to make a reprint necessary, but the varied evidences of delight are already apparent. Even the statistical observations on the book's contents are interesting. Paul H. Oehser, reviewing the volume for the *Washington Post,* notes that "over 60 species of birds are written of (not merely mentioned)" in this "chronological series of 'thumbnail' Nature essays;" and E. Raymond Hall, writing for the specialized readers of the *Journal of Mammalogy,* points out that "even those who know most about the life histories of New England mammals will find facts new to their stores of knowledge in the material relating to eighteen species." With tongue only somewhat inclined toward the cheek, I also am led to suggest statistical grounds for the volume's peculiar interest to July readers, for about thirty-one of *October Farm's* 285 pages of text are devoted to Brewster's observations in July. This, I estimate, is a percentage of 10.87 plus, statistically significant in view of the fact that the month's thirty-one days represent only 8.49 plus percent of the year's 365!

William Brewster shares with Thoreau the attention of those interested in July's children among the charming American writers of Nature. But with Houghton Mifflin's postponement of Canby's selected and edited *Works of Thoreau,* the interest this July, as far as transient timeliness is concerned, is Brewster's alone. Yet it is noteworthy that *October Farm* deals with the same scenes made familiar by Thoreau, has likewise a literary charm appealing to readers in general, and, as Glover M. Allen says in *The Auk,* "should stand on one's library shelf beside Thoreau's 'Journals' as another Concord classic."

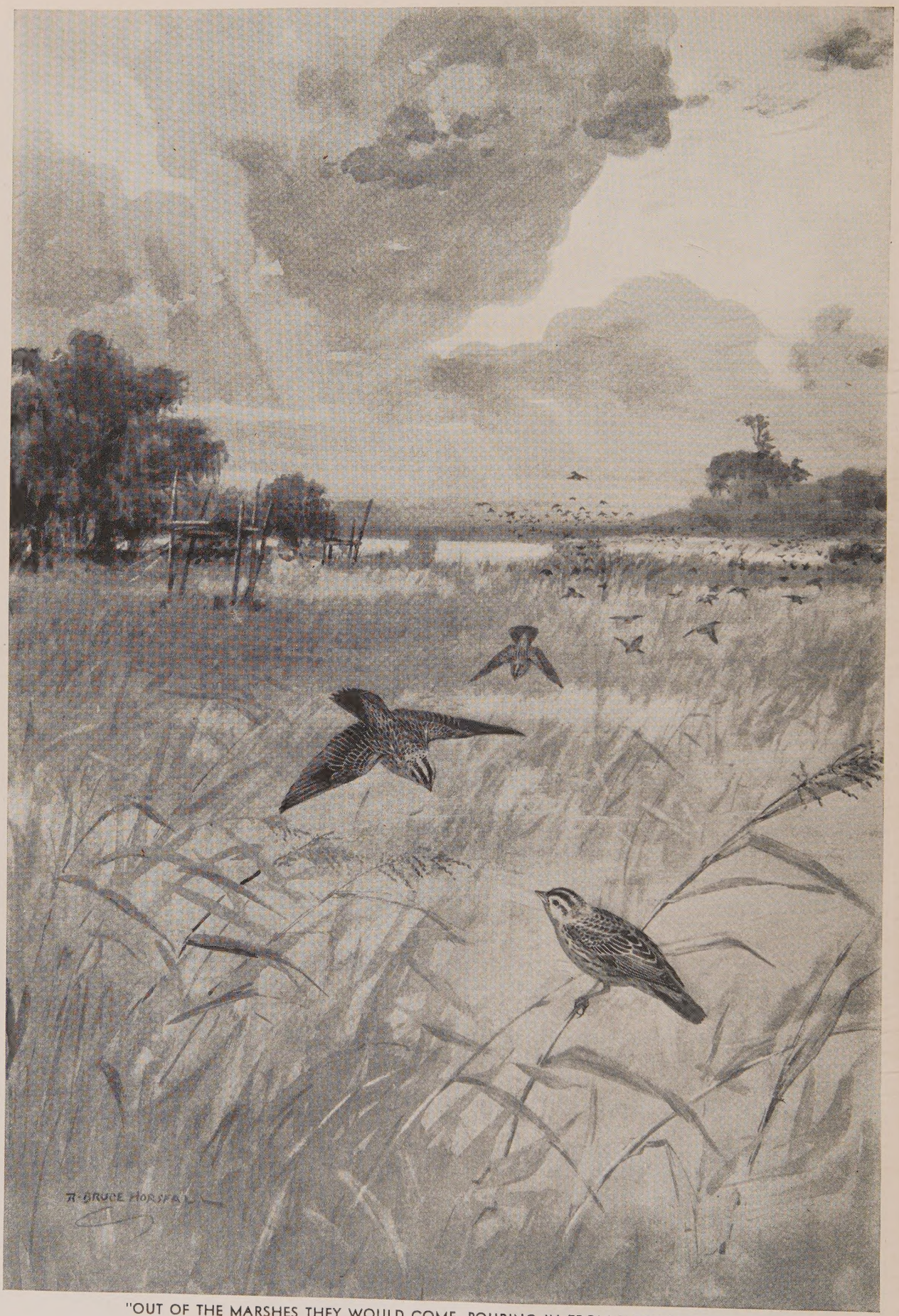
July is often considered a month of less interest than others in its manifestations of Life, but Brewster's writings show at least that July offers enough to exhaust one's time, and for what one has not time to experience there is small cause of concern. July's ministrations in bird songs were with Brewster even in his last moments (he died in Cambridge, Mass., on July 11, 1919, six days after the sixty-eighth anniversary of his birth in Wakefield, Mass.), for his friend H. W. Henshaw tells that even "when the voices of his friends about him awakened no response, he roused himself sufficiently to listen to the song of a robin which came to his ears from the linden tree outside his window."

One need not rely alone on the journal entries of *October Farm* for the knowledge of July birds that Brewster has made available, and it will, in fact, be unfortunate if this posthumous volume does not lead many readers to the author's other works. It was Brewster's happy lot to become thoroughly familiar with three definite areas of the good earth's landscape, and it is now the rare fortune of readers that books on all of these are available.

Brewster's early experience led to his *Birds of the Cambridge Region of Massachusetts,* published in 1906, and I could beguile away much space in quoting from this work such observations as that of July 19, 1880, when he saw "upwards of forty" Baltimore orioles "collected within the space of half an acre in Norton's woods." During nearly forty years Brewster also became familiar with the Lake Umbagog region of Maine when it was still part of America's true wilds, and since his death part of his writing on this region has also been published in *Birds of the Lake Umbagog Region, Maine,* in 1924 and 1925. And now at hand is the record of the third area that he made his, and called "October Farm", beside the Concord River, where for nearly three decades he allowed the wild creatures—predators and all—to have their own ways while he watched, and wrote his journals. These are by no means Brewster's only contributions to outdoor readers—he wrote more than 300 items, including many for scientific journals, *Descriptions of the First Plumage in Various North American Birds* (1878-79), *Bird Migration* (1886), *Birds of the Cape Region of Lower California* (1902), and an edition of H. D. Minot's *Land Birds and Game Birds of New England* (1894)—yet I suspect that the triumvirate of works on the landscapes into which he so successfully fitted himself will be most highly prized.

I should like to sketch Brewster's biography because of its human interest and his attainments, but I shall have to be content with referring to a sketch in *The Auk* for January, 1920, by H. W. Henshaw, one by Witmer Stone in the *American Dictionary of Biography,* and the introduction to *October Farm,* by Daniel C. French, all intimate friends of Brewster, for I wish more to leave to the last a taste of the July morsels in *October Farm.*

In the volume's July entries, which I have just reread with increasing interest, young muskrats gently and confidingly accept the handling of Brewster, flickers carry on their duties at the nest while he watches, a woodthrush concert and the little night sounds of summer are still heard, and a woodchuck swimming across the river turns on Brewster in his canoe and "floating quietly on the surface awaited what it must have thought to be certain death with the calm fortitude so characteristic of its race." "Brave, self-reliant creature!" Brewster exclaims, "I had no trampled (Continued on page 60)




"OUT OF THE MARSHES THEY WOULD COME, POURING IN FROM EVERY DIRECTION"

NATURE MAGAZINE
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# Birds and Ricefields

*By* ARCHIBALD RUTLEDGE

*Illustrated by R. Bruce Horsfall*

ALTHOUGH rice is one of the major crops, not only of America, but of the world, its nature is such that only certain climates are suitable for its planting; hence, beyond the limits of the regions where it is grown, little is known of its culture. Less, perhaps, is known of its relation to the great bird-kingdom, although this relationship is most important.

My boyhood was spent on a great rice plantation near Charleston; and during those years, and ever since, I have had opportunity to watch the growing of this important grain, and to know the birds that live in or near the ricefields. Here, as at no other place known to me, there are immense gatherings of various species; and often huge concourses of different birds, all intent upon feasting upon their favorite food. And here one learns that the best way in all the world to attract wild life is to feed it.

Perhaps the commonest and most persistent visitor to the ricefields is the bobolink. Migrating in late August and early September, this bird, known along the Atlantic Coast as the reedbird, but in the South as the ricebird, is, or used to be, a great enemy of the planter. Their autumnal flight brings them to the South when the rice is "in the milk;" that is, while the grains, though formed, are still soft.

At that time of the year the birds are in their yellow plumage; and when they arrive at the ricefields, they are hungry and thin. Within a week, so gorged are they on the rich food on which they feast that they become ridiculously fat; indeed, so corpulent that if one falls on hard ground when it is shot, it will burst open.

The migrating flocks are not usually great in numbers, but when these groups gather at a ricefield, the numbers appear incredible. I have seen the sky literally darkened by them; and when a great flock would rise, the noise they made resembled distant thunder. Over the delta at twilight, when they would settle in the river-marshes for the night, the whole sky would be alive with them; indeed, they themselves would seem to be a moving sky.

When I was but ten years of age, I was a regular "bird-minder" of our ricefields. My duty was to scare the birds by firing a gun which had, in place of shot, a flattened buckshot. The whistling of this missile above the birds terrifies them; and often roused a feeding flock of several thousand birds in this way. The Negro "minders" used to crack long lashes. But still the birds would come. In memory I can see that host gathering.

First, one bird, from a bush on the margin of the river, would venture to alight in the wide golden field. Then perhaps thirty or forty, flying over, would hear his lone call and join him. Then out of the marshes they would come, pouring in from every direction—five hundred, a thousand—five—ten thousand. As they are very sociable, from far-off corners of the field restless flocks would come to join the big parade.

Sometimes I used to creep through the rice in order to get close enough really to frighten the feeding host. This was ticklish work, as I was barefooted and the field had both rattlers and cottonmouth moccasins in it. At last I would come to a few stragglers on the borders of the great host; plump, yellow, bright-eyed birds that I could almost catch with my hand. Then I would hear them feeding: the endless chirring of their bills against the rice-grains; the occasional soft note of song; the contented, full-fed note. Now I would be among them.

Before me, in an area of rice of not more than half an acre, would be thousands of birds that would rise as a mighty cloud when I fired my flat buckshot over their heads.

On their northward migration in the early spring, the bobolinks reach the ricefields just when the grain is being sowed. At such a time they used to do their greatest damage, for the rice was broadcast on the surface of the wet land, and the visitors, now bright in their gay nuptial plumage, would devour a whole planting. To prevent this destruction, the planters, as soon as the rice was sowed, flowed their fields with water to a depth of several inches. The rice would sprout under the warm water, and the vivid green shoots would come up through it. It so happened that I lived through the time when a regular army of Negroes used to be employed to keep the birds off the newly-planted rice; and I also saw the time when the practice of flowing the fields began. After a few seasons, finding that the food they love best could not be had, the great hosts no longer stopped in their northward flight. But a few hopeful ones would always come; and as a boy I delighted in seeing the brilliant and jaunty males, and in listening to the bubbling of their liquid glee. Because they arrived in early May, they were commonly known as Maybirds. Few birds, I think, change their plumage so radically; and I could never get the Negroes on the plantation to believe that these gay spring visitors were identical with the yellow hosts of the autumn.

"WHEN DISSATISFIED WITH A SHEAF, WITH HIS HUGE FEET HE WOULD SCRATCH IT ASIDE"

Other birds do not greatly disturb rice when it is ripening; but when it is being planted, redwing blackbirds, rusty blackbirds, purple grackles, and boat-tailed grackles will not only eat the seed if they have a chance, but will pull up the sprouts. Once, in a far corner of a lonely field that ran into a swamp, I saw a pair of wild turkeys eating the sowed rice.

It is after the rice is gathered that one has the best chance to observe how many birds literally love this grain. They may be considered in two groups—the plunderers and the gleaners. By the plunderers I mean the birds that ravage the tall stacks of rice-sheaves. By the gleaners I mean those that search the reaped field for what may be left.

The rice on our plantation used to be stacked in the barnyard between the house and the river. The stacks were eight or ten feet high, and sometimes sixty feet long. Naturally, the topmost sheaves were exposed; and in stacks so large, a great deal of rice was available to the visiting birds. But we rarely molested them. They were cold and hungry, and we had plenty of rice.

Imagine on such a stack hundreds of redwings, grackles and rusty blackbirds; scores of cardinals, song sparrows, fox sparrows, white-throats; now and then a bluejay or two, brown thrashers and towhees. Such a festive gathering could not fail to attract birds that did not eat rice. Thus I have found amid the feeding hosts many curious visitors: cedar waxwings, mockingbirds, downy woodpeckers, flickers and even great, black, pileated woodpeckers. These, of course, were merely obeying the human instinct to investigate the reason for all the crowd.

While birds are feeding on rice, one hears a continuous shirring sound, as if the sheaves were being moved. This is from the birds' husking the grains. Of all these feasters I ever watched, the cardinal appears most expert at removing the harsh covering of the rice-grain, with the redwing blackbird a close second. Nor, besides the noise made in feeding, are the birds otherwise silent. Southern winters are usually mild; and from the tops of the ricestacks and from trees overhanging the barnyard will come cries, calls and occasional passages of exquisite song. But there are so many voices, and they are so varied that their effect is that of a medley rather than a chorus.

Over a period of five years we had on the plantation a wild turkey gobbler that we had raised. I well remember what used to happen when he would fly over the barnyard fence to the top of one of the ricestacks. When once he had planted his great bulk there, he was not content with picking off the grains of rice; but, holding down a sheaf with his feet, he would strip off with his bill the heavy heads of the rice. He made no attempt to hull the grains. When dissatisfied with a sheaf, with his huge feet he would scratch it aside, exposing one that was more to his liking. It was to me always spectacular to see this wild gobbler thus feasting alone on the top of a ricestack.

Rice is often used as a feed for game birds. Quail are fond of it. And here we come upon a most interesting sequence of events in Nature. Where rice is scattered for quail, rats and mice will gather; and after these, as perhaps his favorite prey, will come the great diamondback rattlesnake. Keepers of quail preserves have told me that they always warn the owners of the preserves not to take their hunting dogs near the places where rice has been scattered, as rattlers are likely to be there. I know from experience that perhaps the most likely place in which to find a diamondback is in a field of ripe rice. This is because such a place has attracted rats and mice. Several of the largest rattlers I ever saw were killed in a field during the harvest of rice and mice.

"AERIAL SQUADRONS DEPLOYING ABOVE THE VAST DIM FIELDS, AND THEN ALIGHTING WITH HAPPY CRIES IN THE SHALLOW WATERS THAT GLIMMERED IN THE RICE STUBBLE"

There are many birds that are haunters of the ricefields, yet, not being grain-eating, pay no attention to the rice. Thus, at different seasons, it is common to observe there the great blue heron, the night heron, the snowy egret, the wood ibis, the Wilson snipe, the tiny marsh-wren, the coot, and the beautiful king rail. These dwellers in the marshes love the places, and the conditions, where rice is grown.

Of the gleaners of the fields, while all species of blackbirds are prominent in these foraging operations, the wild ducks are the most important birds to be considered in relation to ricefields. The true sea-ducks apparently never eat rice; nor does the wood-duck, as far as I have observed him in rice country. Certainly, if he does, it is with nothing like the relish and the regularity with which mallards, black ducks, teals, widgeons, and blackheads consume it. While all these ducks like wild rice, wild celery, tubers of the waterlily, acorns, wampee, and the acornlike seeds of the lotus (and will throng to fields baited with corn and nubbins of sweet potatoes), their favorite food is rice. In the old rice-growing days in Carolina, when fields of two and three hundred acres were not uncommon, I have seen countless thousands of these beautiful and valuable wildfowl thronging in from the ocean and the salt marshes at night to spend the night feasting in the ricefields. It was a thrilling sight, and one that I countless times enjoyed, to watch these aerial squadrons deploying above the vast dim fields, and then alighting with happy cries in the shallow waters that glimmered in the rice stubble. As the wild ducks never arrive at their winter home until long after the harvesting of the rice, they are not only not destructive but are a positive benefit in that they consume many seeds injurious to ricefields, including the rice itself, which, if left, would come up the next season as feeble volunteer rice.

On a still winter night, standing on the back porch of my plantation home, I have heard thousands of wild ducks on the delta across the river clamoring jovially as they feasted at their favorite banquet-table—a ricefield.

•

# A Walking Fern

*By* GEORGE A. SMITH

TAKE a close look at this plant, and you will understand why it is fittingly called the walking fern. It actually does walk from one spot to another, not exactly as we walk, but by sending out its graceful lance-like fronds until a choice spot is found in which to grow a new plant. In this odd manner, the fern moves from spot to spot over the craggy slopes of a moss-grown boulder or hillside. To find this graceful fern, you must search the crevices of protruding rocks on a wooded hillside. It loves sweet, rich soil, and will grow only in woodland that is alkaline in nature. Limestone often bears it but it is rather tolerant, and grows in many places away from limestone.

# A Striped Dweller of the Fields

*Our black and yellow banded garden spider is not only one of the commonest and largest of our species, but also one of the most interesting*

*By* M. R. CLARE

THE STROLLER through upland grassy fields in late summer is quite likely to meet a relatively huge, long-legged spider with a swollen abdomen crossed by alternate black and yellow bands; a spider that rests head downward, with legs spread radially in pairs, at the center of a large orb web placed vertically in a clump of grass. This is the banded garden spider, *Metargiope trifasciata,* one of the largest and commonest of our spiders and one of the most interesting. You may study them in their natural habitat, or collect them to transfer to the home shrubbery.

The spiders met in the fields are almost certain to be females. The males are too small to attract attention, and can be found only during two or three weeks in late August or early September lurking apologetically on the outer part of the webs. If the male builds a silken structure at all, it is little more than a tangle of threads appended to the web of the female.

Madame Spider's web is a geometrical structure of silken threads consisting, like that of other orb weavers, of foundation lines and radii that form the non-adhesive framework of the web, and of the viscid spiral—a single thread laid down spirally upon the radii and covered with minute beads of a sticky fluid that holds tenaciously any insects coming in contact with it. Immature banded garden spiders construct a more distinctive and elaborate type of web than do the adults. The process of web building starts at night-fall, and the student must be equipped with flashlight and patience if he intends to see the process through.

Stationing herself in the center of the completed web, the spider awaits the lucky chance that will bring some high-vaulting insect against the sticky coils. If the station chosen for the web affords an abundance of insect food, the spider is content to remain there for weeks at a time, as is evidenced by the accumulation of discarded insect remains below the web and by the gradual enlargement of the grass pocket accommodating the web, the latter being accomplished by the tying back of interfering blades of grass. The spider erects a new web in the grass pocket as often as an old one becomes badly torn. For hours on end the spider remains motionless, only at intervals drawing the claws one at a time through the mouth to receive a coating of saliva that prevents their adhering to the sticky loops of the viscid spiral. If a strand of the web is touched with a straw, the spider is on the alert and may be induced to investigate the disturbance. More vigorous annoyance causes the spider to set the entire web vibrating by lifting and depressing her body. If the web is too violently disturbed, the spider drops to the ground and hides among the grass roots.

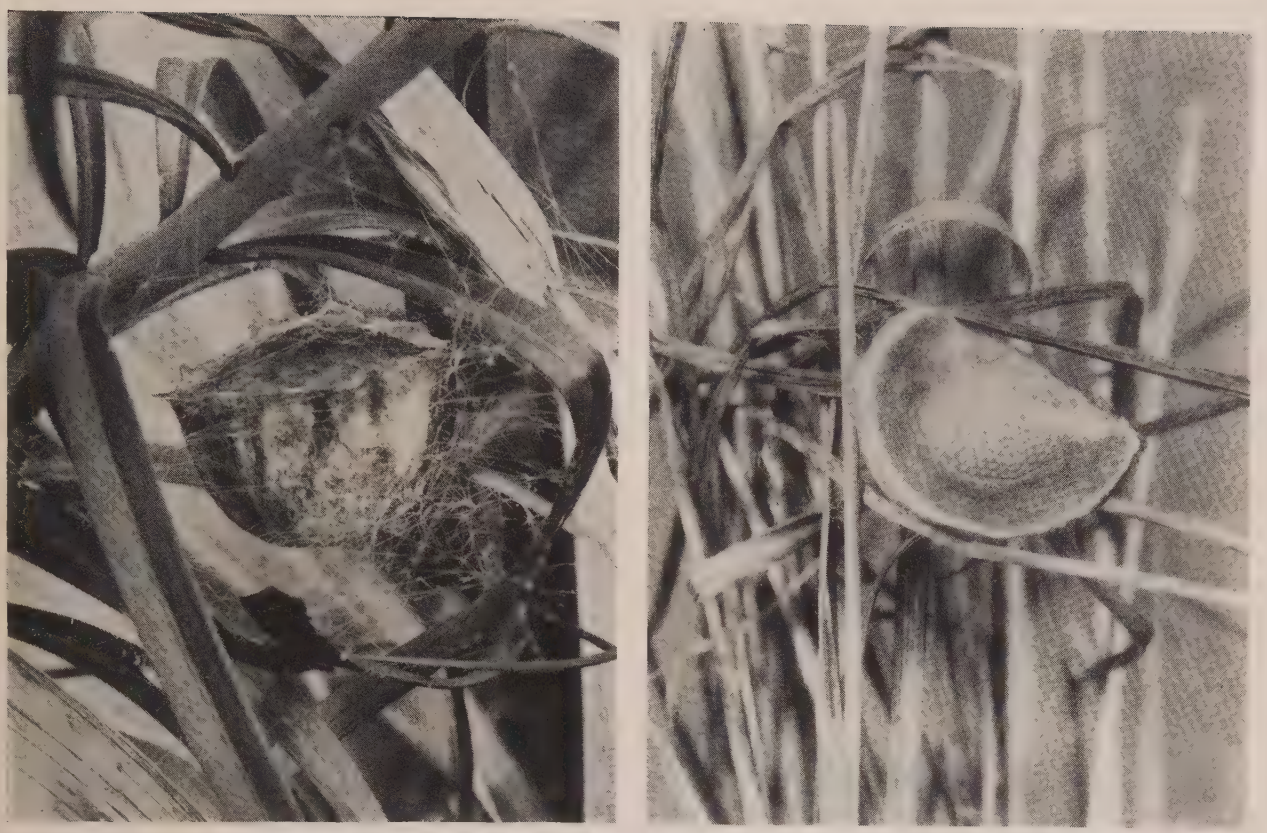
WAITING FOR A MEAL

The banded garden spider spreads her web in grassy places to ensnare grasshoppers, which constitute an important item in her diet

Woe to the grasshopper that becomes entangled in the web! Rushing to the spot, the spider emits many silken threads from the wide-spread spinnerets, hurling them with her hindmost legs over the struggling prisoner. Cutting some of the web-threads supporting the grasshopper, she now uses her fore-legs to roll it over and over, at the same time wrapping it tightly in a silken shroud until the powerful kicking of its hind-legs is quieted. Then, assured of her own safety, she drives her fangs into the prey and injects the deadly venom.

Should the observer be more interested in the behavior of the spider than in his regard for grasshoppers, he will probably capture several of these and toss them one at a time into the web. Each one the spider will swathe in silk, until the web holds several white-trussed bodies.

The amount of silk that a spider can emit is astound-



THE GARDEN SPIDER'S EGG SAC

Although the sacs ordinarily are attached to grass stems, this one was suspended amid the stems of regal lilies in the author's garden. The method of attaching the sac, which is usually four- or five-eighths of an inch in diameter, is clearly shown. The sac pictured at the right has been opened to reveal its structure and the egg cluster in the center

ing. Once, having accidentally injured a large female, I noticed a cable of silk formed of hundreds of delicate threads protruding from the spinnerets. Drawing on this gently, I obtained a strand so long that, before it finally broke, at least two hundred yards of continuous cable had been withdrawn from this one spider!

The method by which spiders feed is no less extraordinary than the method by which they capture their prey. Provided with only a slit of a mouth and an equally narrow gullet, the spider must convert its prey into liquid nourishment. Actually, the injected venom dissolves the cells of the victim into an emulsion that the spider can squeeze out and suck up. When our spider has finished with a grasshopper, nothing remains except the crumpled chitinous shell.

Whence come the banded garden spiders, so common in late summer? Earlier in the season, before their large size renders them conspicuous, we pass them by unnoticed. Yet in May, with the advent of consistently warm weather, one who is visually alert may discover, amid the lush growth of new grass, a ball consisting of several hundred minute spiders suspended within an irregular scaffolding of silken threads. By following the threads downward into the grass one will find that they converge upon an empty egg sac from which the spiderlings have just emerged, and from the shape of this sac can perhaps identify them as the young of *Metargiope*.

Escaping through a small hole that they make in the outer wall of the egg sac, the spiderlings, four to eight hundred of them, begin a migration upward toward the tops of the grasses. This trip requires from five to ten days. Each spiderling, wherever it goes, lays down a thread of silk to mark its progress and to guide it back to its brothers and sisters. During the early stages of the journey toward the upper air, the spiderlings continue close association, clustering into a ball whenever the light fails, as at nightfall, or even when a cloud obscures the sun. In rainy weather the spiderlings remain stationary in compact formation until the atmosphere clears. During the first day out of the egg sac they undergo a moult, leaving their cast skins in the silken scaffolding. As they approach the tops of the grasses they become more individualistic, clustering less and less. When the upper air is at last attained, each spiderling goes its solitary way. Lifting its abdomen aloft, either from the tip of a blade of grass or from the silken scaffolding itself, it emits a thread of silk to be caught by the breeze. To this the spider clings and balloons away. Thus, every banded garden spider enjoys a period of travel and adventure before settling down to the routine of feeding that is preliminary to parenthood.

From about the middle of October until the first frosts the heavy-bodied females construct their silken egg sacs. To witness this process one must keep careful check on the larger females and be ready with flashlight, for the labor begins at dusk and continues throughout the night. In

late fall these egg sacs are not difficult to find if one knows what to look for. Although a female maturing quite early in the season may build as many as three of these structures, ordinarily each female produces only one, at about the time of the first frosts. The operation imposes a heavy drain on the energies of the spider and, as she no longer has the warm sunshine and abundant food to enliven and replenish her failing vigor, she must die with the completion of the task, or soon thereafter.

Each egg sac is a hemispherical body, with the flat side uppermost, firmly secured by cables to several grass stems. The color is at first a dirty white, soon weathering to a brownish tone. If we cut loose the attachments and carefully remove one-half of the outer covering, we expose the architecture of the egg sac. It may be likened to a nest of two pots, a smaller pot set within a larger one and both in contact by their rims with a single, tightly-fitting cover. The inner pot, formed of a dense white silk, accommodates the yellow eggs and is the brood chamber in which the spiderlings are hatched sometime in the winter. From the brood chamber the tiny spiders escape into the space intervening between the two pots where, in the meshes of a loose feltwork of silk, they are destined to live for some time, here undergoing their first moult and attaining their first increment of growth. Eventually they work their way through the tough wall of the outer pot into the external world. In the process of construction of the egg sac, a horizontal sheet of silk, which later forms the cover for the pots, is made first, and then the eggs are deposited in a mass on its under surface. Around the eggs as a center, the two envelopes, or pots, are woven.

Of all animal constructions, none surpass the egg sac of the banded garden spider in the nicety with which it fulfils its purpose. It might be imagined that the chief danger to the eggs would be winter cold; but, actually, low temperatures, unless extreme and sudden, are not harmful to cold-blooded creatures. For small air-breathing animals such as spiders, the destructive agencies of winter are rain and melting snow. The unique perfection of the egg sac lies in its waterproof quality, which, while permitting the slow penetration of water vapor required by the developing eggs, effectually excludes water as liquid. The egg sac, or any part of it, may be submerged in water for days without its showing the least tendency to become saturated. When an egg sac is collected from a rain-drenched field in early spring and is cut open, its interior is as fresh and dry as one recently completed. Thus, even though the winter rains pound incessantly upon its exterior, or the snow and ice crush it into contact with the sodden earth, the egg sac usually preserves unimpaired its freight of tender lives until the return of summer weather brings its usefulness as a cradle to an end.

DISCRETION SAFER THAN VALOR

Despite her reputation to the contrary, this spider is a cautious creature and treats her captive warily until it is safely bound in silken threads

•

## MULLEIN TAPERS

*By* LOIS COLLINS

The mullein holds its tapers high,
A yellow torch against the sky
Sends back again in its gay way
The glory of the sun.
Its leaves are velvet—soft green-gray,
A rosette in bright dew arrayed,
That greets the breaking day.
A fascinating sight!
Around its yellow flame all day,
Gay butterflies may dip and sway
Along the roadside's dusty way,
In warm July.

# CONGO OKAPI

*By* ATTILIO GATTI

*Photographs by the Author*

TEN HOURS' march through the forest with Makulu-kulu, the little devil, continually forcing the pace. Three hours waiting in a tiny, natural clearing, with nothing on which to sit but the soaked ground amid the chilly mists of evening. Then Chief Kalume and the porters arrive. A cup of brackish tea, a tin of I-hope-I-don't-see-any-more corned beef, and some bread only partially rescued from the ants. A few hours of uneasy sleep, and, in the thick darkness preceding dawn, a stealthy advance through icy, dripping vegetation.

And now we are here—Kalume, Makulu-kulu and I—perched on the branches of a big mahogany tree, deep in the Ituri forest in the heart of the Belgian Congo, waiting for the first rays of light to reveal the clearing that Makulu-kulu has assured me lies just before us.

I am here because I have great hope of photographing some okapis when they come in the early hours of the morning to bathe in the stream that borders this clearing. Little Butterfly (which is what Makulu-kulu means) is here because, if the photographic job goes well, he has been promised an umbrella. Why, in heaven's name, an umbrella? He will never use it for its intended purpose, but he has confided to me that no well-dressed chief can be without one. When next he goes to Kalume's village, he will carry it proudly, tightly-furled, be the rain pouring or the sunbeams dancing.

My cramped muscles are protesting violently. Clouds of mosquitoes, marangouins, and elephant flies envelop me. The birds have awakened and are filling the air with their morning chorus. The horizontal bars of the sun are cutting through the veils of mist to illuminate the clearing. Then Makulu-kulu's voice rings out, a harsh shocking sound after those hours of strained silence.

"Well, well," he says (approximately), "we have no okapi today."

I climb stiffly down from the tree and fix Little Butterfly with a baleful eye. But he is nonchalant. Almost leisurely he breaks off a small strong branch in the noiseless fashion they have. Then a lightning dart forward and he has speared a bright green snake that had been concealed in the vegetation a few inches from my boot.

*"Mobaya"*, he says calmly, holding it up for me to see, and *mobaya* (very bad) it must have been, for he tosses it away into the foliage instead of guarding it as a choice contribution to the culinary department, as is his usual custom. After that, of course, I was defeated; I could not be harsh with him for the fruitlessness of our okapi search.

Commander Attilio Gatti is now in the Congo country on his tenth African expedition. A noted explorer, photographer and collector, he has carried on work in behalf of the Royal University of Florence, of the Witwatersrand, the University of Johannesburg, and the Royal Zoological Societies of Rome and Antwerp. Some of his fascinating experiences and discoveries are to be found within the covers of his latest book, *Great Mother Forest,* to be published in this country in the early fall by Charles Scribner's Sons. During the last expedition, Commander Gatti's party spent two years in the Congo, studying the life and habits of the okapi, and photographing and capturing live specimens. The photograph above is of Mr. and Mrs. Gatti at their base camp in the Ituri forest.

Meanwhile, however, other pygmies of Makulu-kulu's entourage had joined us, and one, at his order, melted away into the forest. A few moments later he reappeared with the news that a fresh track had been found, the spoor of a full-grown okapi. The animal, he said, was noisily bathing in the river a short distance away. Taking to the trees, a second pygmy guided us to the spot. Soon the splashing of the animal came to us more and more distinctly until we arrived within a few yards of the stream. The splashing stopped, freezing us into immobility as we stood, two of us with one foot lifted in the air.

A noise of moving leaves told us that the okapi

TOTO WAS THE FIRST YOUNG OKAPI CAPTURED

The characteristic leg markings, when the animal was deep in the equatorial forest, resembled streaks of sunlight filtering through the dense foliage

was aware of our presence—had plunged into the forest on our bank of the river and had stopped there to determine what was taking place. At a warning from the pygmy at my side, all the men I could see suddenly stiffened as the head of the okapi appeared immediately before me.

His throat was the same silvery color as the *mandulu* leaves on which the sun was beating. His head and great ears were almost indistinguishable because of their similarity with the spearlike leaves. Before I was able to realize he was a beautiful male with horns at least two inches long and free of skin at the tips—indicating an advanced age—I had already snapped a half dozen pictures. The order I had given the men to remain absolutely silent and motionless from the moment the okapi came in view until he showed an intention of going away proved sound. Astonished to find himself surrounded by those human statues, to feel so many pairs of eyes fixed on him, the okapi plainly showed his indecision. He turned his head in every direction as if to find a way of exit, or to detect a movement that would decide his course of action.

The only one to break that trancelike immobility was myself in changing films and focusing the camera, although I tried to make every move as quietly and smoothly as possible. And it was upon me that the okapi finally concentrated his attention. His big blue eyes took on that glassy, sinister expression that the natives fear so intensely. His teeth ground with irritation as he laid back his ears, accentuating the strange outline of his head. Then he lunged forward, giving me just time to jump aside as I was clicking my fifteenth photograph.

As for the pygmies, they knew only too well that they were not allowed to use their spears against an okapi but must remain passive before the big animal that already had strained their courage too far. Knowing what those glassy eyes meant, they swarmed into the trees. The okapi found no one before him and in two strides of his giraffe-like gallop had disappeared into the mass of *mandulu.* But the photographs remained, the first successful photographs, so far as I know, that have ever been taken of an adult male okapi in all the majesty of his infinite kingdom, the ever green equatorial rain forest.

The okapi is a member of the family Giraffidae, and is considered by many as an actually living fossil. His head is almost indistinguishable from that of the prehistoric

THE FIRST OKAPI PHOTOGRAPH

Surprised by the ring of humans surrounding him, this adult okapi stopped long enough to become the first ever photographed in natural surroundings before he plunged off into the undergrowth

*Samotherium* of the lower Pliocene of Europe, extinct for the past fifteen million years. His body is like that of an antelope, and his legs have beautiful stripes of pure black and white similar to those of a zebra. The large red ears, the color of the undersides of the *mandulu* leaves, are delicately fringed in black. The back, so dark as to appear black, is shaded into rich tints of dark red, light red and silvery red on the sides and under the belly.

On another occasion we caught an okapi that had fallen into one of our pits in the clearing. The superb animal stood six feet high at the shoulder and almost completely filled the ten-foot pit. When he raised his head his nose just reached to the top of the pit, eleven feet. I had studied the problem of how to get an okapi out, should one fall in, and had theoretically solved it. I had brought with me three anaesthetics, two German specialties, one to be given by mouth with water, the other by injection into the cervical vein. The third was some old-fashioned chloroform that I already had tested on smaller animals that had fallen into the pits. I soon found, however, that my solution was not as good in practice as in theory. To call an okapi "shy", "sweet" and "gentle", as all the descriptions I had ever heard had done, is sheer poetic license. After two hours' work trying to lift the okapi from the pit, I was half stupefied by the chloroform, despite the fact I had worn an old gas mask. The animal was more alive than ever.

LITTLE BUTTERFLY

Makulu-kulu's chief interest in okapi hunting was the prize awarded at the conclusion of the chase

A FULL GROWN OKAPI

The adult animal stands six feet tall at the shoulder, and is as strong as a horse

So I decided to build a palisade around the pit and dig him out. This we did, working all night. Two hours after sunrise, covered with sweat and mud, I suggested to the okapi that, if he wanted to, he could now come out. I shouted "Come on!" at him and clambered over the palisade. "Beautiful," as I had named him, snorted, and in two jumps was out of the hole. A great shouting arose from the trees, where, like so many monkeys, my men had settled, and I turned just in time to see "Beautiful" galloping straight to the point where I had climbed over the palisade.

Didn't he see the palisade, those big trunks fifteen or sixteen inches in circumference firmly tied together? He saw it only too well. A sharp crack, and two poles snapped in two. Evidently what I had supposed to be a bump on his forehead was a thick bony plate, as hard as steel. In this magnificent specimen this "iron forehead" was developed to a remarkable degree. Another bang with his head and he had battered through the palisade and galloped off into the forest.

No one, until he has the opportunity of seeing this strange animal in his own surroundings, can imagine the impression he makes as he strolls through the tangled forest. His queer rolling gait, his size and strength, his extraordinary inflexibility of purpose, give him the appearance of a creature emerging for the moment from the bygone past.

Usually he walks slowly, trying to avoid the pools of water and mud so that he may not soil his spotless white legs. If necessary he can keep up that rolling gait for an entire day without showing the slightest fatigue. He can travel at an average of six or seven miles an hour, a speed that is phenomenal in the forest. Enormous fallen trees suspended in mid air, entanglements of lianas, stumps, piercing thorns, steep climbs, gluey swamps—nothing stops him. What he can he jumps; where it would seem impossible, he passes under. His big woodenish legs, which seem to be made only of bone, bang against thick vines and green branches, breaking them as if they were sticks.

The okapi gives constant care to his precious coat; cleanliness, in fact, appears to be his most striking characteristic. The rain, dripping from the trees after a rain, a splash of the reddish mud of the forest, seem to irritate him. During the day, and even during the night in the intervals between sleep, the okapi never tires of washing himself carefully, licking his skin at every point that his long blue tongue can reach. That means his entire body; for his prehensile tongue, although of the ruminant type, is sixteen or seventeen inches in length and coils and uncoils like a snake. His head can easily reach his tail as he bends his long neck as if it were joined at the base by a hinge. The okapi is a confirmed solitary and an untiring wanderer. Where one finds himself toward evening there he makes his bed, perhaps a full day's march from the sleeping place of yesterday.

TOTO'S TONGUE

Toto is shown here smacking his lips after doing away with a choice morsel. Extended to full length, as it was when he washed himself, the tongue measured seventeen inches

The okapi's first act in the morning, and the last before going to sleep, is to bathe in the river. He does not roll in the water, but gallops through it, taking good care to choose a place where the bottom is sandy so that the water splashing over him cannot become muddy. He has good reason to be jealous of his skin, for in addition to its glorious colors it has other great advantages. The darkness of the back blends almost perfectly with the near-black appearance that the vegetation has at five or six feet from the ground, where it is thickest. The black and white stripes of the upper part of the legs mimic the stripes of light and shadow projected through the lower part of the foliage, and the white of the stockings resembles the silvery color of the dried leaves on the ground. The result is that at five or ten yards' distance, the maximum visibility in the forest, he is practically indistinguishable. Another peculiarity of the okapi is his large eyes, which have, independently of each other, an extraordinary field of rotation, enabling him to look in two directions at once as does a chameleon. When quiet, the expression of his eyes is sweet and gentle, but at the slightest alarm it changes to a hard, glassy appearance that the pygmies and natives greatly fear. It is only in such emergencies that the okapi, which has extremely rudimentary vocal chords and a larynx rendering him as dumb as a giraffe, utters one of the two sounds I have ever heard him make—a snort similar to that of a horse, or a loud grinding of the teeth.

After having covered during the day more miles than a man could make in a week of effort, the okapi carefully selects a resting place for the night. It must be dry, clean, slightly elevated and well protected from the rain. A last careful toilette, a last sacrifice to that spirit of cleanliness that keeps the animal free from ticks and flies in a world of mud and insects, and the okapi lays his head on a high root or liana as on a pillow, thrusting his great hypersensitive ears forward to safeguard his sleep. Thus he rests.

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# STARS BY DAY

*By* GENEVIEVE RUSSELL

All day long the stars go by,
Marching up and down the sky.

Orion with his jewelled sword
Seeks the bull, whose head is lowered,

While Sirius, the mighty one,
Trails the chariot of the sun,

And Procyon, the lesser hound,
Never stops to look around

But ever at the huntsman's heel
Hopes for steak at his next meal.

The Pleiades let down their hair
And weep for one who is not there,

And fair Capella keeps her light
Beaming gently till the night.

The Dipper, in the sun's last ray,
Dips a drink from the Milky Way,

While Pegasus, the winged horse,
Munches at the heavenly gorse.

Andromeda, freed from her rock,
Holds Perseus in friendly talk

And both go swinging down the west
Upon a never-ending quest.

We cannot see them, you and I,
But all day long the stars go by.

# "Thy Doublet of Changeable Taffeta"

*By* LAWRENCE R. HOLMES

CLOWN: "Now the melancholy god protect thee; and the tailor make thy doublet of changeable taffeta, for thy mind is a very opal."

*—Twelfth Night*

CAMOUFLAGE is a new word but an old art to the Old World chameleon-lizard. During the winter and spring of 1935, while living in a suburb of Beirut, Lebanon, on the eastern shores of the Mediterranean, where fig, orange, date-palm, banyan, and eucalyptus trees abound, I acquired several of those strange eccentrics as pets. I let them live in my room, most of the time free to wander wherever they chose, trying new color combinations and discovering, among the draperies, Persian prints, and Oriental rugs, many new patterns to challenge their artistry.

I had in the past tried making pets of various reptiles, including turtles, lizards, a baby alligator and an infant boa-constrictor, but none have been so entertaining, so tractable, or so adaptable, as my chameleons. Indeed, adaptability is the chameleon's especial genius. Although I caught five of them that one season, it was invariably when I stumbled upon them, so to speak, by accident. On every occasion that I deliberately sought them, I failed.

It is from the eye of the chameleon that the impulse to change color originates. A blind chameleon would not be able to alter his aspect to suit his surroundings. But it is not simply the environment that inspires the chameleon to "alter when it alteration finds." Choler as well as color has this magical effect. The eye is linked by nerves to the endocrine glands, and these glands, by the blood stream, to the skin cells. Like the turkey-gobbler's neck, or the irascible man's countenance, the chameleon's complexion mottles, flushes, darkens, as the hiss of fear or anger issues from his open mouth. But red, blue, and purple are absent from his spectrum.

Yet his "doublet of changeable taffeta" is not the oddest of the chameleon's specialties of adaptation. There are, likewise, the sensitive, prehensile tail, the long glue-tipped tongue with which he lassoes his insect prey, the hand-like feet, and, most fantastic of all, the rotary, independently-pivoted, protruding eyes by means of which he achieves literally a universal range of vision.

The particular chameleons to which I became personally attached were the martyr, Mousso, and his successors, Violet and Fatto.

Violet, so christened ironically because of her disposition, might sincerely have been named "Violent". I likewise considered "Ratto", for if Mousso was the size and shape of a mouse, Violet was the size and shape of a medium-large rat. Violet was a tough egg. I caught her on a tree, and was nearly bitten doing it. She opened her mouth, hissed, and lunged at me then, and did so ever after, as long as she remained in captivity, whenever I approached within two feet of her. The second day, I had her on a branch that had been stuck into a bottle of water. I looked at her, and she lurched at me so belligerently and hissed so suddenly that I jumped, knocking over the bottle and precipitating Violet to the floor.

REPTILIAN ROOMMATES
Violet and Fatto, in an unusually quiet mood, pose on the author's hand

But this formidable front is used by the chameleon only as a last resort. He is, at heart, a most self-effacing creature. In addition to his flexible protective coloration, he has other mechanisms for expressing his natural modesty. When a potential enemy approaches, his first reflex is to move to the opposite side of the branch on which he is resting, and to exhale most of the air from his rather chesty body. Thus he shrinks and shrivels to about one-half of his ordinary volume. He then stands perfectly still, hoping you will pass him by. If the chameleon has any vanity, it does not take the form of resentment at being ignored. Indeed there is something almost abject in his crouching, cowering, and drawing away from you when you approach. But when you come within a foot or two of him, and he realizes he is discovered, his abrupt change of attitude to one of fuming vituperation soon convinces you that the chameleon is, at least at heart, no craven.

How Violet would fume, change color and cling to my fingers with her toe-nails whenever I took her in my hand! Believe me, when she was on you, you knew you had something! When most excited, her usually green skin would assume small, round, brown specks, and a generally D.T. demeanor.

One evening I caught an enormous cockroach. It was too big and brown and horrible to touch, so I picked it up with a pair of tweezers and popped it into Violet's mouth while she had it open cussing me out about something. In a few minutes Violet was munching away, "Archie" crisply crackling the while, like toast being masticated.

Fatto was about poor Mousso's size, except in girth. Fatto was so round and plump when I first got him that he looked like a little long-tailed pig. He could hardly budge. He thinned down a bit after a few days, however, and budged. One particular picture of him that I recall was when he sat perched on a branch on the window-sill in the last stages of shedding his skin, looking like a leper, or at least like a remorseful sunbather.

A NEW KIND OF BANYAN TREE

The chameleon companions could not figure out why this peculiar three-legged tree had no branches and leaves to scurry over

However, the first, favorite, and fated of these reptilian roommates was Mousso. Although he had the size and the appearance, in some positions, of a mouse, he had, in common with the rest of his species, many of the habits and mannerisms of a monkey. But when he marched along a level surface, nose pointed straight ahead and tail even straighter in the opposite direction, his gait was so even, and the mechanical precision with which he alternately planted first one and then the other hind foot directly behind, barely touching, the receding forefoot, was so perfect that he resembled no other living creature in the world. He was more like a robot.

I used to give him the run of my room, and he did plenty of running. I accidentally stepped on him twice, but he survived that. I used to let him walk around on me. Wherever he went he always kept at least one eye fixed on my face. That inevitable eye, along with the turned-down mouth corners—and chameleons have enormous mouths—gave him a doubting, baleful expression.

In the winter, at night, I used to wrap him up in a big Indian print and put him in a drawer in my desk. In the morning when I took him out he was always groggy, but soon thawed out if the sun was shining. After being kept in the dark he was usually a sort of jaundice yellow. In the electric light he was yellow with regular black markings. During the day he would change from buff to jade green to brown, and often green or gray with spots, stripes, or blotches. Whenever he got mad or sat in the direct sunlight he would turn dark brown, almost black.

His feet were double, like hands, or rather, like little boys' hands with mittens on. The forefeet of these creatures are divided, with two toes on the outside and three on the inside; the hindfeet, vice versa. Chameleons do not pick things up with their hands, but they climb with them in a manner that is marvelous to behold. They go hand over hand up a branch or a cord like a sailor climbing a rope ladder. Their tails, however, give them an added advantage over sailors, and put them into the simian class. Like all chameleons, Mousso walked steadily and deliberately, *upright* on his four feet, like a cat, not crawling on his belly like an ordinary saurian. He was always equally at home upside down or right side up. If you touched the tip end of his long tail, it would, by simple reflex, watchspring up into a perfect coil, like a butterfly's tongue.

He could turn his eyes in any direction, each of them entirely on its own. One would be looking forward and the other backward, or both backward. You could have the odd sensation of standing directly behind him and having him stare you straight in the face.

I believe he looked upon the human hand as a branch of a tree. He was about as large as your thumb. When he came to the end of your finger, he would stand upright on his hind legs, supported by his tail like a kangaroo, and grope in the air with his forefeet as if he were shadow-boxing.

I once observed him in the act of catching a fly, but I was obliged to employ strategy. I had always fed him by force. Extremely fastidious, he would never feast when I was watching him. I was nothing in his life but one great inhibition. So I rigged up a little box containing a stone, a dish of water, and a branch, and placed the open side flat against the window. This let him get sunshine—too much, as it turned out—but it prevented me from seeing him in action. In the cold air of the winter he had been practically comatose, but in the warm sunshine he was like a monkey. I put several flies in the box with him, all of which disappeared after a short time. One day I put a mirror outside on the window-ledge, which enabled me to look at him, indirectly, without attracting his attention. I put a

fly in the box and watched. The source of his self-consciousness being apparently removed, he was aware of nothing except the fly, which he followed avidly with both eyes, wherever it went. He remained suspended by his tail and one hind leg from the branch. Whenever the fly came near him he became excited, and started toward it, his mouth half open and the tip of his tongue hanging out. Finally his victim came within range, and sure enough, out went the tongue, a full three inches, the length of Mousso himself, excluding his tail. The tongue had a wide, cylindrical tip to it, sticky, which caught the fly and spooned it back into Mousso's mouth where it was munched at leisure.

But I am afraid that as the season wore on toward summer I kept him too long in the sunshine in that box. One day his tongue came out, and he couldn't get it back into his mouth again. It hung out about four inches. So I let him go, thinking that he might do better out of doors, free. I put him in a shady place among some leaves, and came back in about an hour. He had tried to get away, and his tongue, all dried up now, was wound around and stuck tight to a stem. It was with difficulty that I got it untangled. Of course there was only one thing to do then, for his tongue was dead anyway, and he couldn't live without that. He had that same baleful expression as he looked at me, suspicious and mistrustful as always. It was tragic. I could hardly expect him to regard me as his friend, but I had to put him out of his misery.

From such an end, Violet and Fatto, who came afterwards, were spared. While they were still in good health and lively spirits, I took them out one morning after a shower, and set them in the branches of a banyan tree. The first thing that Fatto did was to step from stem to stem and lick drops of water off the leaves. But Violet wasted no time indulging in refreshments. She started immediately to climb upward, with only occasional backward glances in my direction. Once I took my eye off of her. I never saw her again after that.

VIOLET BECOMES VIOLENT

A bit peeved at the request to pose on an orange atop the camera tripod, Violet gives vent to her displeasure

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# The Cactus and the Mesquite

*By* GLENTON G. SYKES

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THE WRITER has known of several instances in the desert regions of the southwest where cactuses have been observed growing on trees. The case shown in the accompanying photograph is, perhaps, one of the best examples of this phenomenon.

The plant, a prickly pear cactus, has seven stem joints and is growing in a depression on the upper side of a large limb of a mesquite tree about fourteen feet above ground. The scene is in the Baboquivari Mountains, about fifteen miles north of the Mexican line, in southeastern Arizona.

# An Orchid Giant

*By* S. JUDSON EWER

THE LARGE-LEAVED REIN ORCHIS

A long tramp to its haunts rewarded the author with this rare find. Amid ferns and mosses it rears its spike of greenish blossoms

It was the end of June and the lush verdure of spring had merged into the deeper fulfillment of summer. I was hiking up a moist woodland ravine rich with plant life and pulsating with the drowsy hum of insects.

I might have called this spot the "Ravine of the Ferns," for their bright green fronds grew in abundance all about me. I pushed through waist-high osmundas and turned aside the downy silvery spleenworts. Graceful narrow-leaved spleenworts, a none too common species in the vicinity, and the bolder Goldie's shield fern obstructed my path. The slender bulblet bladder fern hinted at the presence of a bit of lime in the soil, and the maidenhair, beloved by all Nature enthusiasts, raised its delicate and airy leaflets upon black, wiry stipes.

But the ferns, no matter what their grace and beauty, were not my chief quest this June afternoon. I was after even rarer botanical game. A year or two before I had found the leaves of a giant orchid—one of the rein orchis group—somewhere near the head of this ravine, and now I was out to relocate the plant, make sure of its identity, and, if it were in bloom, obtain a photographic record of it in its woodland home.

The ravine became narrower and the banks drew closer together with rocks and ledges partially barring the path. Water that had spread out over the ravine floor to form a woodland swamp, now coursed as a small stream and trickled among the mossy rocks. Was my orchid to the right or to the left? Would that single plant be here again this year? Would it be in bloom? The book gave June to August as the flowering date, and surely I was in plenty of time, but perhaps some vandal had preceded me and carried it away.

And then I saw it—a tall cluster of bloom held high above the surrounding ferns. The afternoon sun sifted through the tree-tops and threw a shaft of pale light over the delicately-colored green-white flowers. There were eighteen splendid blossoms, each nearly an inch across, and grouped into a graceful raceme fully seven inches in length. At the base of the eighteen-inch stem lay two broad, fleshy leaves, measuring six by seven inches in length and breadth, and of a shiny gray-green color.

There was no gaudy display, and had the plant been smaller it would scarcely have been noticed, so well did it blend into the green of its surroundings. For its beauty it relied upon the grace of its flowers, its gigantic spreading leaves, and the dignity bestowed upon it by sturdiness and vigor of growth. An orchid giant—*Habenaria macrophylla*—the large-leaved rein orchis.

I set up my camera and photographed the plant in its sun-dappled surroundings. Then I plucked a single flower that I might study at my leisure its detailed structure and observe that marvelous plant mechanism—an orchid flower. There was a long, narrow "lip," small rounded sepals and petals, and a nectar-containing spur one and one-half inches in length. At the center of the flower a fleshy-white column bore the stigma and the curious pollen masses, each enclosed in a little sac and with the sticky discs ready to attach themselves to the head of a visiting insect. When this occurred the pollen masses would be withdrawn and carried from flower to flower in the process of cross pollination. Among our orchids we may study and marvel at Nature's ingenuity for the transfer of pollen; man-made machines are no more adapted to their ends than are these highly evolved plant structures.

Having finished my quest I left my orchid unmolested to live its life among the shifting shadows of the woodland, hoping that no selfish person might thoughtlessly destroy it and thus despoil one of Nature's rarest treasures.

LASSEN PEAK IS THE MAIN ATTRACTION OF THE PARK

PHOTOGRAPH BY RIES

With beautiful Reflection Lake and the wooded area surrounding it as a setting, Lassen volcano rises several hundred feet above timber line

# MORE THAN JUST A VOLCANO

*Although many believe Lassen Volcanic National Park is barren and uninteresting, save for Lassen Peak, it abounds with a variety of animals, plants and scenery.*

*By* RUBY JOHNSON SWARTZLOW

*Uncredited photographs by the Author*

LASSEN Volcanic National Park was created by Congress in 1916 because the volcano is the most recently active one within the boundaries of the United States. Since the volcano has been recognized as the outstanding feature of the park, there is a widespread idea that the region is barren and uninteresting save for that one feature. Hundreds of visitors each year voice their surprise at the scenic beauty and the lush vegetation of the area.

Lassen Peak, the southernmost in the Cascade Range, elevation 10,453 feet, was named after Peter Lassen, a pioneer of the 1840's. It dominates the topography of the area yet is easily accessible to a normally active person. A well-built trail, two and one half miles in length, leads to the top of the mountain, where today one may see active steam vents in the craters formed by the most recent eruptions (especially those of 1915 and 1917). From the peak a panorama of the surrounding country, including Mt. Shasta, the Klamath Mountains, the Coast Range, and the northern Sierra Nevada spreads before your eyes. Close at hand are rugged peaks, lava flows, rushing streams and evergreen forests dotted with placid lakes.

The man whose name Lassen Peak bears was born in Copenhagen, Denmark, in 1800, and as a youth was a blacksmith. He came to the United States in 1829 and worked at his trade along the eastern seaboard and in Missouri. From the latter place he crossed the plains to the present site of Oregon City, and from there went to San Francisco by boat. In 1842 and 1843 he worked for Captain John A. Sutter for some time, taking his pay in stock. Northbound emigrants stole some mules and Lassen's pursuit of the culprits took him to the north Sacramento Valley. He was so pleased with the country that he obtained a large grant of land from the Spanish governor and established a town on his ranch. Peter Lassen piloted emigrants over the Cascade Mountains on their way to the gold fields of California and used Lassen Peak (then called St. Joseph's Mountain) as a landmark. It was because of this that the peak and Lassen's name were always associated and that the mountain is appropriately named.

The famous route known as Noble's Trail, the most feasible and popular route across California during the 1850's, passes through Lassen Park for several miles. Parts of old wagons have been found and some of the old wagon wheel tracks are still visible along some parts of the trail.

Until May 30, 1914, this volcanic mountain had been

PHOTOGRAPH BY RIES

THERE ARE MANY HOT SPRINGS IN THE PARK

Bumpa's Hell is one of the most active, and chemicals in solution have colored the soil with the reds, yellows, greens and purples of iron, sulphur, and other compounds

quiet as far back as white man's knowledge extended. Then, a series of eruptions began, some violent. An unusually complete set of photographs of the eruptions was taken by B. F. Loomis, who was in the area at the time and who remained in order to get the pictures. This valuable photographic collection is housed in the Loomis Memorial Museum at Manzanita Lake. The building as well as the collection was given to the National Park Service by Mr. and Mrs. Loomis. The museum contains other exhibits, chiefly historical, geological, botanical and zoological.

A mud flow and subsequent hot blast occurred on May 19 and May 22, 1915, and produced what is known as the Devastated Area, a desolate region several square miles in extent. The mud flow was caused by molten lava that rose in the crater and melted the heavy snow pack high on the slopes of Lassen Peak. Mud, rocks and water flowed down the mountain side and tore up trees and shrubbery. These materials were carried many miles down the valleys of Hat Creek and Lost Creek, leaving huge piles of debris lodged against the sturdier trees.

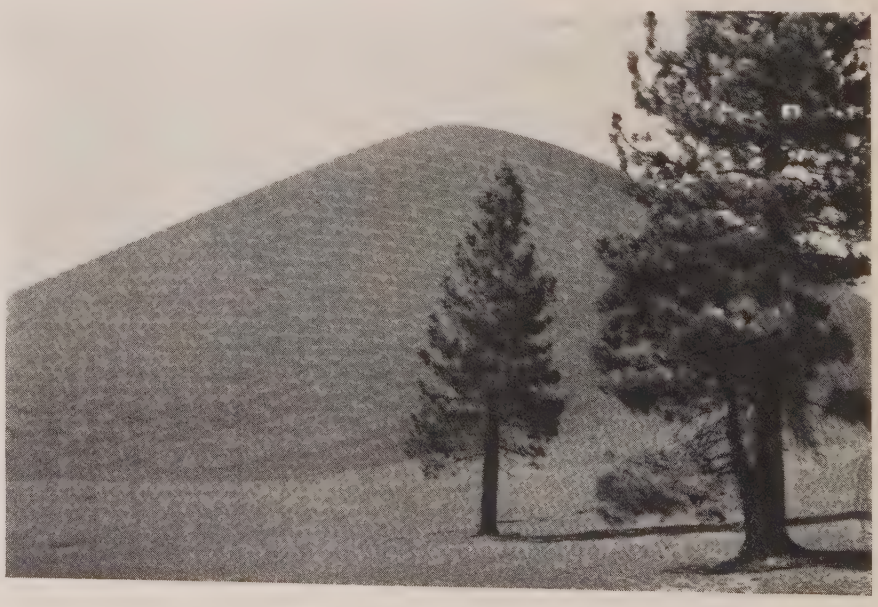
The lava causing the mud flow solidified, and steam and other gases accumulated under great pressure within the volcano. On May 22 the force became so great that the lava burst forth and travelled down the mountain side in nearly the same path as the mud flow, demolishing whatever the mud had left. Trees three feet in diameter were snapped off like toothpicks and large masses of rock were hurled thousands of feet. The area was denuded of vegetation and every living thing within the path of the flow and blast was killed.

Mute evidence of the destruction is plainly visible in the region today. Reforestation has begun in portions of the area, and Nature is rebuilding. Various kinds of grasses and sedges are present, as are some species of flowers, dominantly lupine. Seedlings of trees, mostly Jeffrey pine, with scattering lodgepole pine, are found in some parts of the area.

Although the volcanic mountain is the outstanding feature of the park, the area contains other intensely interesting and fascinating phenomena. Probably the most spectacular features are the hot springs. These springs are found in several localities and cover large areas. Associated with the springs are boiling pools, solfataras, steam vents and mud pots. Three hot spring areas are easily accessible by trail, namely Bumpa's Hell, the Sulphur Works, adjacent to the main highway, and the Devil's Kitchen. The coloring in these regions is unusual—varieties of yellows, browns, reds, greens, and purples evoke the admiration of all who visit the section. Here one may see mineral sulphur in process of deposition, and pyrite, or fool's gold, being formed.

CINDER CONE, EVIDENCE OF RECENT VOLCANIC ACTIVITY

The cone measures approximately 600 feet from base to top, and a lava flow of basalt at the bottom has strewn huge blocks of lava over many square miles of surrounding territory



PHOTOGRAPH BY RIES

**VEGETATION ALSO IS ABUNDANT**

False hellebore, *Veratrum californicum,* locally called corn-lily, enlivens the open glades of Lassen Park

Certain features of the Park are accessible only to those who hike the trails. This is in conformity with Park Service policy throughout its many parks. A unique combination of a cinder cone, unusually symmetrical, a lava flow covering several square miles, chromatic volcanic dunes in various hues of brown, purple, orange, and red, and a lake formed by a basaltic lava flow, all clearly visible from the top of Cinder Cone, is found in no other place in the world. The top of Cinder Cone is accessible by trail only.

Another wilderness area that is being preserved and can be visited only by hikers or pack train parties, is the area adjacent to Twin Lakes. These lakes are not extensive but offer special attraction to those who desire to be near lakes away from the glare of headlights and the blare of automobile horns.

For those who love the quiet peace of small Alpine lakes, no area in the West can compare with that of Lassen Volcanic National Park.

Manzanita Lake, among the more than forty lakes, is familiar to all those who have visited the Park. So small that most people marvel at the number of fish taken from it each season, this lake was formed during the avalanches of the Chaos Jumbles when some of this material dammed up Manzanita Creek. Reflection Lake, situated across the highway from Manzanita, probably occupies one of the numerous depressions created during the throwing out of this jagged dacitic material from the crater on Chaos Crags.

Butte Lake is also one of the most easily accessible lakes. It is an easy hike from there to Cinder Cone, one of the best examples of recent volcanic activity found in the United States. Snag Lake and Widow Lake may be reached by trail from Butte Lake.

Many of the most beautiful lakes of the park are of glacial origin. Boulder ridges, moraines and glacial striae are commonly seen. During the Pleistocene period much of the Park area was under a thick cover of ice. One of the centers from which the ice radiated was probably White Mountain. In the valley to the north of this mountain we find three pretty glacial lakes, known as Terrace, Shadow and Cliff. The group is often referred to as White Lakes, due to the proximity of White Mountain, so-named because it retains snow on its flanks throughout most of the summer. The trees around these lakes are chiefly mountain hemlock, although some white fir is also present. If these lakes are visited early in July when the snow is melting enough to clear the slopes, the beautiful western windflower may be seen in full bloom in the rocky soil.

Lassen Volcanic National Park and its environs are favorite places for botanists to study the flora of northern California. More varieties of trees are found within the Park boundaries than in any other similar area. Life zones range from Upper Sonoran to Arctic Alpine. The most common trees are the western yellow pine, Jeffrey pine, lodgepole pine, incense cedar, sugar pine, white fir, Douglas fir, red fir, western white pine, white bark pine and mountain hemlock. The manzanita and tobacco brush are

**RESULTS OF ONE VOLCANIC ERUPTION**

Large trees were snapped off by the eruption of several years ago, but new vegetation can be seen recovering the denuded area. Photograph taken in Lost Creek Valley, several miles from the volcano

the most common shrubs. Natural gardens of wild flowers exist along Manzanita Creek and in King's Creek Meadows, with literally hundreds of varieties of flowers in bloom during the summer months. When the snow begins to leave in the spring, the crimson snowplant makes its appearance and blooms until late fall.

The deer, both Columbia black-tailed and mule, are quite tame and feed throughout the summer on the grasses of the meadows, especially King's Creek Meadows and Dersch Meadows. They are common night visitors near the Manzanita Lake Campground and frequently have been seen grazing on the lawn in front of the Loomis Memorial Museum. They seem to sense that the Park is a game preserve and stay within its boundaries until the close of the California hunting season, unless driven to lower altitudes by cold rains or snow.

The golden-mantled ground squirrel and chipmunk are friendly visitors at camp throughout the summer, frequently making pests of themselves at the camper's food cupboard. Coyotes are present, but seldom seen. Porcupine, rabbits, chickarees and skunks are occasionally seen. The bear is not common, although it is reported on the average about twice during the season.

Those who enjoy bird study can find plenty of interesting friends. Some of the summer visitors that are present are the gayly-colored western tanager, the warblers, the warbling vireo, the water ouzel, the humming-birds, blackbirds, and finches. Hawks, owls, and eagles are quite common.

In addition to the land birds, the lakes attract many water birds. In the spring one of the early visitors at Reflection and Manzanita Lakes is the great blue heron. The belted kingfisher also frequents these lakes. In the fall various species of ducks and geese pause to feed on the vegetation of the lakes in their flight south. A pair of American egrets visited near Manzanita Lake during last September and October. Hours of careful watching and searching failed to reveal any nest, but it is hoped they will return again this fall.

In winter mood, Lassen Volcanic National Park attracts those who love winter sports. If cold weather comes before snow falls, skating on some of the shallow lakes becomes a major sport. Although the Loop Highway partially encircling Lassen Peak is not open in winter due to heavy snowfall, ski enthusiasts may enjoy their sport at the southern entrance to the Park. Amateur meets are held at intervals throughout the winter and a ski meet is held annually near Lake Helen, at the base of Lassen Peak.

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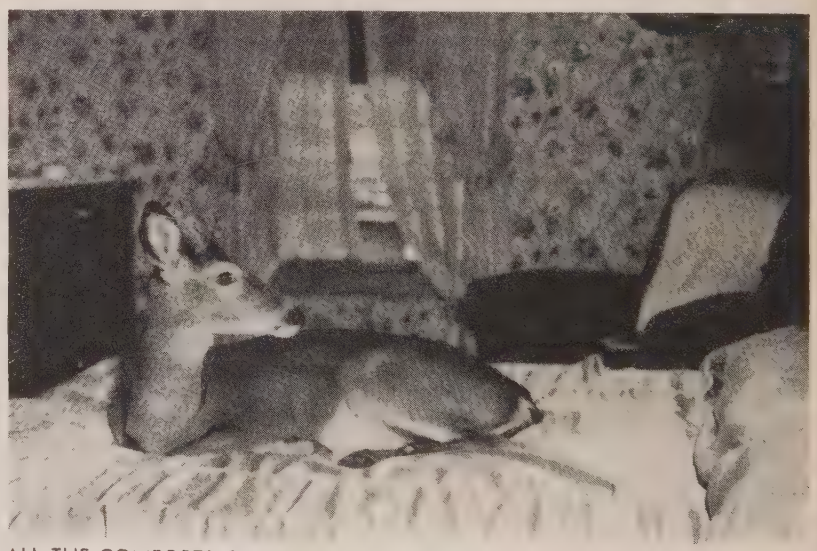
# BARNEGAT'S MASCOT

## *By* GENEVA HAYDEN

ON A RECENT trip to Barnegat, New Jersey, I was invited by my business associate to spend the evening at his home. After dinner I was astonished to hear my host say to his wife, "Where's the deer?" "Oh," replied his wife, "I don't know, upstairs asleep I guess." Mystified, I said, "That sounds like a good story. A deer, did you say—upstairs?" "Yes," my host replied, "and here he comes."



ALL THE COMFORTS OF HOME

Inner-spring mattress, lace curtains and flowered wallpaper in a private room is the lot of this orphaned deer, befriended by a wildlife loving citizen of Barnegat, New Jersey

True enough. Clap, clap, went tiny hoof-beats on the stairs, and into the room walked a beautiful deer. He came up to me at once, placing his soft muzzle in my hand, and admitting me to the friendliness of this remarkable home.

The story was that my host had found this lovely creature a year and a half ago, a lost waif, forsaken at the edge of the woods nearby—perhaps driven there by a forest fire—no one knew. He took the fawn home, nursed and cared for him, and today he is the mascot and pet of Barnegat. He trots about the streets, in and out of stores, often nibbling at what looks good; a privileged character that is beloved by every one. When evening shadows fall, home he comes, and after supper and a visit with the family, he runs upstairs to the *guest room* where he sleeps like a prince on an inner-spring mattress with all the trimmings.

The picture was taken on December 18, 1936, when the deer was nineteen months old. He looks quite at home with the flowered wallpaper, and lace curtains. It is unbelievable that any forest floor was as soft a spot as this—all for a trusting, friendly little animal that in his natural environment is one of Nature's most timid wild creatures.

Here is a true story that carries its own message and points its own moral. We have visited the little sanctuary that is described. We have met "Of Thee I Sing" and know first hand of her struggles. We know intimately the physical and mental regeneration that her hospitality to the birds has brought. We know of the remarkable banding records of this comparatively small bird haven. We know, also, that this sanctuary is worth saving, not only for what it does and has done, but because it would stand as a symbol of the preservation of something fine in the face of that destruction often miscalled progress and civilization. We hope that some way will be found to save this tiny avian oasis in order that the juncos, goldfinches, purple finches, tree sparrows and fox sparrows pictured here may find refuge there another winter. If you are as interested in this sanctuary as we are we will be glad to place you in touch with "Of Thee I Sing."

# Story of a Sanctuary

*By* "OF THEE I SING"

DESPAIR gripped me as I watched an axe biting deep into the heart of a locust tree! "Clearing the land—" the woodsman told me. The tree crashed. It seemed as if a part of me were dying.

Why should I care that a "modern development" was soon to replace the wooded hill-side? Why! Because life for me, without those trees, would be an empty thing. Were the many sacrifices to save this home, because of that bit of woodland, to be in vain? What a fool I had been to believe that anything—even a beautiful ideal—could last without money! Money can't buy happiness! Perhaps not. But only money can preserve happiness. Even the blessed happiness that grows out of heartache and sacrifice cannot survive without it.

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My husband built this home for me, hoping to restore the health wrecked by hardship and bereavement. Sunsets, trees, walks along the lovely countryside began to heal. Then came the accident that made me a house-bound invalid.

One gray December day, fifteen months later, I was sitting by the window wondering how much more I could endure. The wind, the swirling snow, my own bleak existence, were driving me crazy. Suddenly a cheery voice called to me from out of the storm. Clinging to the piazza railing was a tiny gray bird. His black cap was pulled low over his eyes and a black muffler was knotted snugly under his chin. He seemed pitifully small to be braving that howling blizzard! Yet "chick-a-dee-dee-dee!" he trilled; then repeated it three times, so I'd surely know him. His friendliness—and need—were plain. Somehow I crept to the door with a handful of crumbs, little knowing I thus placed upon this home the message to all bird-folk—"Sanctuary!"

Taking only enough food to refresh himself, Chicky was wafted away like a puff of down. So warm was the glow a tiny bird had lighted in my heart that not even a memory of my tragic thoughts remained. If he would only come back again! And then I heard more bird voices. Chickadee returned with all the relatives and friends he could get together on such short notice. I tossed out crumbs by the handsful, and when I went to bed that night, it was in a spirit of hopeful anticipation that deadened much of the pain. Would my new friends be waiting there, in the morning? They were, God bless them!

No longer was I a prisoner watching the world go by my door. As the weeks passed, I made me a world out of a backyard; a world that satisfied my every need. I couldn't go to the birds, so the birds came to me in ever increasing numbers. Drawn to the woods and old orchard, hundreds and thousands of birds crossed the stonewall boundary. Many of them came up on the piazza and windowsills; eventually even into my room. No longer was I a pain-racked cripple. My troubles were forgotten in the need of the little feathered friends who had done so much for me.

Then came unemployment; my husband's serious illness. Without my birds, I couldn't have gone through the dreadful time that followed. One day I found myself staring dazedly at a small pile of money on the table. Six dollars and forty-four cents! All we had in the world, save a small life insurance. *My birds!* How was I to feed my birds? Fifty—sixty—dollars for their food; and all we had was six dollars and forty-four cents, for all of us, for everything!

A stray sunbeam suddenly touched the crested head of a male purple finch that was feeding on my windowsill. Its jeweled loveliness kindled in me a wild inspiration where, but an instant before, had been only black despair.

I knew nothing about writing but I wrote a little story about my birds and sent it to an editor. I had cast my bread upon the waters and it came back in black diamonds for the coal bin and food for my birds. Somehow, after that, there was always a market for my stories when I was hard pressed to find the money to buy food for my birds.

Hard times followed; but the birds were fed, even when my shoes were too thin to wear on the street. The birds were fed, even when my husband and I were spending two dollars and fifty cents a week for three meals daily. Impractical! Idiotic! Perhaps; but we couldn't turn away the hundreds of birds that came to us for sanctuary. Feeding the birds meant far more than just putting out bird seed for them. It meant the preservation of our pride, our hopes, our happiness. Unhappy thoughts and fears that might have clouded our days were swept away by the good cheer of countless bird voices. We seasoned our simple fare with the milk of human kindness. It stimulated both body and soul. We never reached the end of the rope, because we still had something to share.

THE BANDING YARD

Here thousands of birds have found haven. In the background the threatened woods

Six months' search for work landed a job that we hoped might eventually suffice to keep us. Yet not till I lost children, health and livelihood did I find the healing that comes only from close companionship with trees and birds and the simple common things.

At last I had discovered the way to close the door on a world in turmoil. The woods were my church. There I found peace and understanding. No day passed that I could not count perfect hours. Sacrifices had become privileges. The passionate gratitude I felt toward the birds had lifted me out of myself, filled me with an all-absorbing desire to make everyone kind to all little birds.

As if in answer to my desire, a daily newspaper started a "BIRDS I KNOW" column. Writing under the name "Of Thee I Sing", I sent in a few stories about my birds, hoping to gain new friends for the little creatures that had remade life for me. I succeeded beyond my wildest hopes. Through the many stories that followed, given freely and without pay, my birds have winged their way into hospitals and sickrooms in many states. They have cheered invalids and shut-ins by giving them a new and absorbing interest. They have taken their beauty into homes where it was sadly needed. They have carried whiffs of sweet country air into hot city bedrooms. They have planted the seed of kindness in many a thoughtless heart. They have lighted a spark in lives gone hopelessly drab, even brought joy to a girl who could not see. They have forged a bond between parent and child. The good they have done has been bounded by neither age, creed nor distance. Stories of this backyard kingdom have actually found their way into a nun's cell in a Scottish convent. Many of the sweet sermons my birds and trees preached to me daily, soothing my hurts and easing my way, I passed along to unknown friends. Heartfelt letters that came back to me made life a glorious venture.

Scornfully unmindful of the fact that our material prospects had, by now, almost reached rock-bottom (for even the life insurance was almost gone), my morale was lifted high by the mere knowledge that I still had something worth giving. Possessing only happiness derived from my birds, I gave it with both hands. And the more I gave, the more there was to give. The miraculous was happening in my tiny kingdom, and its boundaries were expanding daily.

A bird-banding permit brought the birds literally into my hands, opening my eyes to colors and markings lovely beyond words. Three winters ago, Massachusetts was invaded by evening grosbeaks for the third time in a century. The largest flock reported in the state was the flock that came to me. About one hundred and fifty of these rare and lovely visitors devoured twenty pounds of sunflower seed in less than two hours, within ten feet of the house. We succeeded in banding only nineteen. But the tiny pine siskins that seemed always with the grosbeaks (they being by no means common guests) were the friendliest little creatures imaginable. Of the four hundred and seventy-two that were banded in the entire country that year, fifty-seven were banded here. The following summer, I banded twenty-six of the one hundred and sixty-five rose-breasted grosbeaks banded. During February and March, 1936, I banded sixty-five redpolls in nineteen days; and only twenty-four were trapped. Forty-one came into my room to eat their dinners in the saucers of seeds placed on the floor for them; and after they were fed and warmed, I caught them easily and banded them. It was the first winter in twenty years that redpolls had been seen here, and seven greater redpolls that I banded in my room made me feel favored indeed, for greater redpolls are very rare visitors. More than two hundred and fifty birds have thus been banded without being trapped.

Last summer, fifty-three young chewinks played around the yard in small groups, within fifteen feet of the house, and I banded every one. (Continued on page 60)

# TWICE-BLOOMING IRISES

*By* THURLOW WEED

How would you like to have clumps of irises that bloom twice a year growing in your garden? Your desire may now be gratified, thanks to the plant wizards. Twice-blooming irises have been developed and placed on the market within the last half dozen years. They are making as much of a furore in the flower world of today as spineless cactuses did in the horticultural world a decade or more ago. These unusual irises, of course, have not been perfected to a point equal in beauty to their more regularly blooming relatives. But even so they make welcome additions to the garden; you will find that they produce flowers when color is most needed.

When a famous horticultural firm in France placed on the commercial market some years ago two dwarf varieties that they declared to be ever-blooming, there was some skepticism on the part of cynical American flower lovers. But the few American iris specialists who ventured to import these foreign originations soon were completely convinced of their merit. These beautiful little gems have been blooming in my garden for the past four summers.

True, the individual flowers still leave something to be desired, but the novelty of having irises bloom throughout the summer months is sufficient reason to grow them. Their names are Jean Siret, a clear yellow bloom, and Lieutenant de Chavagnac, a mixture of violet, bronze and cream. These irises bloom in the early spring and, providing one has a number of plants, they will surprise the flower lover with a new blossom now and then all summer and far into the autumn.

Soon after these two dwarfs were imported from Europe, three American varieties were noticed to possess the same unusual blooming trait—Autumn King, a fairly tall lavender; Autumn Queen, a small, attractive dwarf white; and Ultra, a rich blue dwarf. To these three may be added the variety Allies, a copper red, that occasionally but not invariably produces blooms out of season.

Their interest fully aroused, American hybridizers started experiments using these off-season bloomers as pollen and seed parents for new seedlings. Thousands of seedlings were grown and a limited number inherited the twice-blooming characteristic. The best of these plants were placed on the commercial market. Among the first to receive wide distribution were Dorcas Hutcheson, a slightly-fragrant deep violet; Equinox, reddish-purple; Diogenes, blue-purple; Golden Harvest, olive and citron yellow; September Morn, mauve pink; Laura Hutcheson, lavender blue; Peggy Babbington, soft lemon yellow; Neola, brown; Autumn Surprise, light blue; and Paltec, deep blue.

A little later came Sangreal, yellow; Black Magic, midnight blue; Sound Money, a golden dwarf; Autumn Elf, lavender and cream; Maid of Tennessee, ruffled blend; Olive White, cream and gold; and September Skies, deep purple. These are mediocre irises when compared to the beautiful, large, and tall spring-blooming varieties, but they are valuable garden additions because of their twice-blooming characteristic.

BEAUTIFUL LATE BLOOMERS
This photograph, taken in September, pictures the Frost Queen, Olive White and October Opera

During the last year or two, the concentrated work of our most able American hybridizers has brought about excellent results. Fall-flowering varieties have been made available that compare favorably and in some cases are even superior to those that bloom in the spring. With the advent of new colors, taller stalks, and larger flowers, the popularity of this new type has increased until the demand has become greater than the supply.

The finest twice-blooming varieties now available for the amateur gardener are the Eleanor Roosevelt, a huge deep purple flower that produces so many blossoms to a stalk that one cannot see the stem; Autumn Dawn, old gold and pink blend; Jane Krey, rich dark purple; King Junior, prolific blooming lavender; Frost Queen, large frosty white; October Opera, rich red; Franklin Roosevelt, the most outstanding red-purple; Martie Everest, tall blue; Southland, rich chrome yellow; Autumn Frost, pale cream; Autumn Gleam, beautiful citron yellow; Autumn Haze, purple and violet; White Autumn King,

TO KEEP YOUR GARDEN BEAUTIFUL UNTIL LATE FALL

October Blaze lends a striking note to the fall garden; the Franklin Roosevelt is one of the most outstanding of the fall blooms; the Southland is the best autumn-flowering yellow variety

pure white; Constance Schreiner, lavender violet; Polar King, tall white; and October Blaze, red-purple.

In addition to these bearded irises, one must not forget the odd winter-blooming Stylosa Speciosa, light blue in color, which flowers profusely throughout late fall and early spring in the milder sections of the South and the Pacific Coast. Unfortunately, it cannot be grown in the colder regions.

All forty varieties mentioned here, with the exception of Stylosa, may be grown successfully throughout the country and will bloom at least once each year. More than half of them are quite reasonable in price, costing twenty-five cents to one dollar. Their second blooming depends on the climate and length of growing season, as in the colder states early autumn frosts occasionally nip the buds, preventing full development. It is interesting to note in this connection, however, that one of the new autumn-flowering varieties was originated in the cold state of Minnesota, another in Massachusetts, and a few others north of the Mason and Dixon line. The bulk were originated in the gardens of that famous Nebraska hybridizer, Hans Sass.

"I have about twenty twice-blooming varieties growing in my northern Illinois garden," a friend of mine wrote recently. "All of these have produced off-season bloom, but they do not do this every year. However, enough produce a second flowering to make them well worth growing."

The two varieties named after the President and the First Lady are planted at Warm Springs, Georgia, where their off-season blooms delight the patients.

The odds that a plant of one of these summer- and fall-flowering varieties will bloom a second time is increased by keeping the roots well watered during the months following their early spring blooming. Watering and soil cultivation stimulate the irises to continue growing instead of falling into a semi-dormant state as is customary with iris rhizomes during the summer months.

An iris root that blooms in the early spring has a number of young increase roots that grow to sufficient size to bloom the following season. With cultivation and moisture, these increases develop to such size during the summer months that, after producing increases of their own, they sometimes obtain sufficient strength to bloom. In other words, the twice-blooming irises really grow and multiply twice as fast as ordinary irises and thus crowd two years of growth and bloom into one growing season.

To obtain the best success with these wonderful irises, one should plant them in the most protected spot in the garden—a place where they will not be touched by late spring or early fall frosts and where they will benefit from a maximum amount of sunshine. The soil should be fairly rich and of a loose and non-acid character. In all but the extreme southern sections, where early fall planting is advisable, the best time to transplant bearded iris roots is during the three summer months. Inasmuch as most other plants need to be moved in the spring or fall, this unusual planting time of the iris fits well into the schedule of the amateur gardener who finds time hanging heavy during the beautiful summer months.

It is too much to expect that the newly-planted roots will bloom the following autumn, though they sometimes present a glorious surprise by so doing. But they will produce a number of flowers the following spring, and in all likelihood will have become so adapted to their new location that they will bloom a second time that summer or fall.

In such states as Oregon, Washington, California, Texas, Kansas, Nebraska, Tennessee, Kentucky, Virginia, Oklahoma, Georgia, Arkansas, and the Carolinas these ever-blooming types grow to perfection; in states having more rigorous climatic conditions, they do not bloom so dependably but are well worth cultivating as an experiment. When they are afforded protection by a frame from early autumn (Continued on page 57)

FROM A PAINTING BY CHARLES R. KNIGHT

THE SABER-TOOTHED TIGER
This formidable beast roamed the southern parts of Europe and North America while the northern parts were buried by the same Ice Age that we today are experiencing

# OUR OWN ICE AGE

*Although the layman considers "the Ice Age" as a period of glacial advance and retreat that came to an end in prehistoric times, many modern scientists believe that we are in the final stages of one today*

*By* CHARLES FITZHUGH TALMAN

*Photographs courtesy United States Geological Survey*

EUROPE was the scene of an extraordinarily severe winter a few years ago. Such an unwonted spectacle as heavy snow on the Riviera led newspaper writers to remark, "It is like the ice age," and some of them suggested: "Perhaps the ice age is coming back." In any severe winter we may read similar statements. This idea of a *returning* ice age causes geologists to smile, for reasons that I hope to make clear in the present article.

Several times in the history of our planet thick mantles of glacier ice have spread over vast areas of its surface that at other times have been ice-free. Certain periods within which these ice sheets advanced and retreated are called ice ages. The one of latest occurrence is often described, without qualification, as "the" ice age—a designation surviving from the time when nothing was known about the others—but for purposes of distinction it is known as the Quaternary Ice Age.

The latest invasion of the ice left its marks far and wide over the landscape of northern Europe and northern North America. The mighty glaciers, pushing down from the north, planed off the tops of hills and mountains and gouged broad U-shaped valleys between them. The geologist points to a tract of upland on Long Island and says: "Here is a dumping-ground of the ancient ice sheet." He tells us that Boston's Bunker Hill is a glacial trash-heap; that Minnesota's ten thousand lakes mark the places where glacial-borne débris dammed the ancient watercourses. He explains how innumerable boulders were scattered by the moving ice over the face of New England, and broad layers of pulverized rock, now turned to clay, were deposited by the same agency in the Mississippi Valley.

When did all this happen? The Quaternary Ice Age *began* in the Pleistocene period—the division of geological time immediately preceding the Recent period, in which we live. There is a good deal of uncertainty about the time of its beginning; an estimate of from 600,000 to 700,000 years ago seems most plausible. To the layman this may seem rather remote antiquity until he learns that the earth was then, according to the current estimates of geologists, at least 1,500,000,000 years old (not a mere 20,000,000, as we once believed, with Lord Kelvin), and may have been more than 10,000,000,000 years old. Compared with such an episode as the formation of the coal measures, for example, the beginning of the ice age was an event of yesterday. Coal is supposed to have lain in the earth for something like 250,000,000 years.

The ice sheets gradually spread from certain centers in high latitudes into lower latitudes, and from high mountains, such as the Alps, into the surrounding plains, until, after scores of thousands of years, a warmer climate set in. The advance then gave way to an equally slow retreat, and it is possible, though not certain, that all

ICE AGE CALENDAR IN THE ROCKS

The settling sediment in glacial lakes of long ago built up the layers of clay that formed this rock. The thickness of these layers or "varves," as science terms them, reveals the comparative warmth of the summers in which they were formed. (Cf. Talman's *Prehistoric Weather* in January issue.)

the great glaciers on the globe were melted away. Later came another gradual advance and another retreat. In North America there is evidence of five large-scale movements of this sort in each direction, and in the Alps four have been traced. The advances occurred during periods when the climate was relatively cold and the retreats during periods when it was relatively warm. The former are now referred to as "glacial periods" and the latter as "interglacial periods," so that the term "glacial period" is no longer used, as it once was, as a synonym of "ice age."

When we come to consider the final retreat of the ice from low latitudes and altitudes we are dealing with events that were, geologically speaking, altogether modern. Many estimates of the time elapsed since the ice withdrew from places in our own country and elsewhere have been based upon measurements of certain natural processes—such as the cutting of the gorge at Niagara—that are supposed to have gone on at a fairly constant rate ever since the land was laid bare of ice, and the figures arrived at are rather conflicting. Generally they run into the tens of thousands of years. Recently, however, a method of timing late ice age events has come into use that gives us definite dates for some of these events in Europe, and ultimately may do so for other parts of the world.

Many lakes adjacent to glaciers and fed by streams from them receive deposits of coarse, thick and light-colored sediment in summer, when the ice is melting rapidly, and fine, thin and dark-colored sediment in winter, when there is little melting. Such deposits form distinct layers in the clay banks that were once the beds of lakes at the edge of the retreating ice sheet. These annual layers were first studied in Sweden by Baron Gerard de Geer, who named them "varves," while the clays in which they occur are said to be "varved."

The varves vary considerably in thickness from one year's deposit to another, and similar series of thick and thin layers are found in widely separated localities. By matching sets from different places and by noting the positions occupied by corresponding layers in each vertical series, it is possible to determine the rate at which the front of the ice sheet retreated. In Sweden the average speed of recession was about 1 mile in 9½ years. With the aid of a number of young university students De Geer made an elaborate survey of the varved clays of that country and thus worked out a detailed chronology for the retreat of the Scandinavian ice sheet.

The dates of this chronology were definitely determined with relation to one another, but not to the chronology of human history, until finally one of De Geer's assistants, Ragnar Lidén, made a remarkable discovery. He found a place in central Sweden where varves had continued to be formed in a river delta by the annual melting of winter snows after the ancient ice sheet disappeared, down

BROUGHT FROM AFAR BY THE ICE

Big granite boulders such as this one found near Hardwick, Massachusetts, may have been carried many miles by advancing ice masses. The wall also is made of ice-worn boulders, all too plentiful in parts of New England

THE BED OF AN ANCIENT GLACIER

This broad U-shaped valley is typical of mountain country that once was covered by an enormous glacier. The comparatively smooth slopes and the absence of jagged peaks testify to the grinding power of these huge ice sheets

practically to the present time. Thanks to this lucky find, geologists are now able to assign approximate "B.C." dates to some of the more recent ice age events in Europe.

These are strikingly recent. A part of central Scandinavia was still under ice as lately as 7,000 years before the Christian era, when humanity already may have emerged from barbarism in western Asia. The settlement of northwestern Europe must have closely followed the retreat of the glaciers, the land being occupied almost as soon as it was laid bare of ice and first mantled with vegetation.

The ice left southern Sweden about 13,500 years ago and uncovered the site of Stockholm about 10,000 years ago. It withdrew from the southern shores of the Baltic about 18,000 years ago. We have no definite figures for the time it began to retreat from its most advanced position in central Germany, but if the rate of movement was the same at that period as at later stages, the retreat began about 21,000 years before our time.

Varves have been found in parts of the world remote from northern Europe and many series have been measured in North America. Ernst Antevs, one of De Geer's assistants, found that the ice took 4300 years to retreat 185 miles up the Connecticut valley from Hartford, Conn., to St. Johnsbury, Vt. Measurements by Chester A. Reeds in the Hackensack valley, near New York City, indicate 100 feet a year for the rate of recession in that vicinity, and it has recently been stated on the authority of Reeds and Antevs that the whole journey of the ice front from its extreme southern location on Staten Island to northern Canada occupied 29,000 years, begining with an exceedingly slow rate of movement for the first twenty-five miles of its northward journey.

These North American events have not been tied up positively with modern chronology. According to De Geer, there are many striking correspondences between the varve sequences in Sweden and those found in America and elsewhere, so that it is possible to apply his "Swedish time scale" to dating ice age events in distant countries. It is difficult, however, to accept this view. Varves, like the annual rings of trees, register past weather from year to year; the thicker deposits having been formed in relatively warm years and the thinner deposits in the cooler years. De Geer's opinion implies the assumption that there were simultaneous fluctuations of weather, year by year, during long periods of time in regions thousands of miles apart, and this hardly seems credible.

And now we come to the most interesting of all facts about the ice age, and one that is evidently not suspected by anybody who talks of a possible "return" of the age in question.

It is an almost universal custom, even among geologists, to speak of the ice age in the past tense. Thus De Geer, in working out his time scale, found it necessary to adopt a certain date for the "end" of the ice age, which he placed 8700 years before the beginning of the present century. Events that happened after that date are described as "post-glacial." This particular date represents fairly well the time when the ancient ice sheet in Scandinavia broke up into mountain glaciers of the modern type, and it is a convenient point to reckon from because it is marked in the varve series by an exceptionally thick layer, formed when a huge lake, previously dammed by the ice, broke from its bounds and flooded the country. Thus are records of the past read.

As an episode in the history of the earth as a whole, however, the ice age did not end at that time—and *it has not ended yet!* We are *now living in the ice age,* and it is not at all certain that we are living in its final stage. The present period may be an interglacial one that will be followed by another glacial period as severe as the last one.

The Quaternary Ice Age spread over the globe a blanket of ice that attained a maximum area of about 12,000,000 square miles—one-fifth the total land area of the earth. Only about half of this ice has melted away. The rest remains in the polar regions and in high mountains elsewhere. The Antarctic ice cap alone, with a horizontal surface of more than 5,000,000 square miles, is actually a million square miles larger than was the Pleistocene ice sheet of North America at its largest.

The geological record shows that the presence of these enormous masses of ice on the earth is not a normal condition. It is a condition that has prevailed at long intervals in the hundreds of millions of years of the earth's existence and each period has always been of relatively short duration.

"Under normal conditions," says Professor A. P. Coleman, "the world has a relatively mild and equable climate, with no permanent ice at low levels, even in the polar regions. From time to time, though at irregular intervals throughout its history, there have been relatively short periods of cold, accompanied by a great extension of mountain glaciers and sometimes also by the formation of ice sheets at low levels. In the most severe visitation of the kind ice sheets invaded the tropics on three or four continents. Ice ages are, in most cases, broken by interglacial periods of milder climate. All parts of the world have their temperature lowered during an ice age; the tropics as well as the temperate and polar zones. In general, one may say that a great ice age lasts for at least some hundreds of thousands of years and may continue for a million years or more. This is, of course, quite insignificant as compared with the greater subdivisions of geological time during which the climate of the earth was mild.

THE ICE AGE AT ITS MAXIMUM

This map of North America shows the area covered by the Pleistocene ice sheet at its greatest extent and the three main centers from which the ice flowed

"When one remembers that during most of its history the earth, as shown by fossils, has been free from ice sheets even in the polar zones, while now there are about 6,000,000 square miles ice-covered, it is evident that we have only half emerged from the Pleistocene glaciation. Until Greenland and Antarctica are set free we cannot claim that the ice age is entirely over."

So it appears that mankind must wait many thousands of years, at least, for the end of the ice age. This fact need not, however, be deplored. Our present interglacial climate is marked especially by strong temperature contrasts between the ice-clad polar regions and the ice-free regions of lower latitudes. These contrasts cause a brisk circulation of winds, frequent storms and incessant weather changes in the temperate zones; and such are the conditions that favor the development of vigorous and civilized races of humanity however much we complain about the weather.

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# EMPTY

*By* CARRIE ADAMS BERRY

Has a wizard waved his magic wand
And brought the earth this blankness?—
A smothering white in empty woods
Where life has teemed in rankness?

Chipmunks are sleeping in their lairs,
Pine-mice lie close in hollows . . .
No desires that prompt activity,
No care for aught that follows.

# ★ Conservation ★

**A part of Nature Magazine each month is devoted to the expression of practical opinions on the vital issues affecting our use and abuse of natural resources, including wildlife, and dedicated to the purpose of assisting Americans to play a militant part in the attainment of constructive conservation aims.**

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## CONSERVATION & REORGANIZATION

While there appears to be little prospect that the proposals for reorganization of Federal departments and bureaus recommended by the Brownlow Committee appointed by President Roosevelt will be acted upon at the current session of Congress, the plan is by no means permanently pigeonholed. It is, therefore, an issue that should not be ignored and allowed quietly to proceed to fruition obscured by other more spectacular questions.

There are many proposals of the committee that should and will receive careful consideration and discussion. To us the most important of these relates to the redistribution of governmental agencies administering our natural resources, and charged with their conservation and wise use. In this regard, what did the Brownlow Committee recommend. First, it said, in effect, that the Department of the Interior would be renamed Department of Conservation. Its duty would be—

"To advise the President with regard to the protection and use of the natural resources of the Nation and the public domain.

"To administer the public lands, parks, territories, and reservations, and enforce the conservation laws with regard to public lands and mineral and water resources, except as otherwise assigned."

To achieve these purposes various bureaus, services and responsibilities would be transferred from the Department of Agriculture. The committee goes into no details, but recommends that the duty of this Department would be—

"To advise the President with regard to Agriculture.

"To conduct research on agricultural problems; to continue and develop relations with state and local governments in agricultural research, agricultural education, and the conservation and development of private lands and other resources affecting the agricultural supplies of the Nation; and to enforce and administer laws dealing with agriculture."

We cannot escape the feeling that the Brownlow Committee gave only cursory thought to the question of conservation. It is purely a guess, but we cannot help but feel that the committee was assured that the President has conservation very much at heart and that it need not discuss this issue at length in its report. Whether or not this is so, the fact remains that the rescrambling of the administration of natural resources would be left to Mr. Roosevelt through a blanket authority given to him by Congress.

There is in our estimation, however, one glaring weakness in the Brownlow Committee idea. That weakness is failure to recognize that every activity having to do with administration of *renewable* natural resources should be coordinated under one head, and should be separate from the non-renewable natural resources.

Obviously the prime object of reorganization is closer-knit direction, efficiency and economy. Yet we discover in the committee's report the definite proposal that the new Department of Conservation shall administer natural resources of, on, and in public lands; that the shorn Department of Agriculture shall concern itself with research and the conservation activities related to private lands. On such basis a bird, mammal or fish in a National Forest or Park would be a Department of Conservation responsibility only until it flew, ran or swam across the line of bordering ranch property. If this be coordination, may Heaven help the wildlife. By the same token the Department of Agriculture might be studying conditions that would indicate that some species should have complete protection, but its need for such protection would have to be "sold" to another department. History teaches that such plans have rarely worked.

Let us take, for example, our ducks and geese, birds whose fate is still in the balance. On the basis of the Brownlow recommendations most of the conservation

functions of the Biological Survey would be shifted to the new Department. The research work would not. Therefore it seems plain that, for example, the men studying the numbers, habits of migration, diseases, nesting problems, and enemies of these birds might well find that closed seasons were vital to preserve this waning resource. But the promulgation and enforcement of regulations to this end would rest with individuals removed from and more than likely insensitive to the results of research. Surely this is not coordination.

So far as distinguishing between renewable and non-renewable natural resources goes, the Brownlow Committee ignores such distinction. Conservation of our remaining wealth in forest, wilderness, wildlife and recreational assets on public lands would be mixed with the exploitation of our resources of coal, metals and oil with which these same lands are endowed. The two do not mix. Too often resources of the latter class have been developed at the expense of the former.

Many have inveighed against the way man has upset the balance of Nature. Certainly he *has* upset it, and he has also made many bungling gestures in attempts to re-establish a balance. Now comes this proposal that would further increase difficulties by drawing imaginary and illogical lines in places where Nature made no divisions.

In short, the Brownlow report holds out little promise of helping the conservation situation. On the contrary, it carries a threat to real conservation progress unequalled in seriousness during the past forty years. We have no specific indication of how the President would mix the bureaucratic stew should Congress authorize him to do the cooking. But we do know rather definitely with respect to conservation, at least, what the ideas of the present Secretary of the Interior are, and we assume that they would serve as a guide to Mr. Roosevelt.

We are still convinced that any reorganization should be built upon the principle of placing renewable natural resources in one place—research as well as administration —regardless of present location. And on the basis of past performance we repeat our conviction that such coordination can best be effected under a Director of Conservation within the Department of Agriculture.

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# A Ravished River Glimpses Glory

THIS is the excellent title given an article by Arthur L. Shaw of the engineering firm of Metcalf and Eddy of Boston and published in the May issue of *The American City.* Here we find graphically and forcefully pictured the results of pollution. We reprint Mr. Shaw's article here without comment. It needs none.

"An interesting example of the rapidity with which a stream, given a chance to cleanse itself, will resume the appearance of respectability and re-establish its congeniality towards fish life became apparent in the Merrimac River in the summer of 1936. Unfortunately, however, this same river soon afterwards gave a striking demonstration of how quickly a polluted stream can lose its attraction for aquatic life.

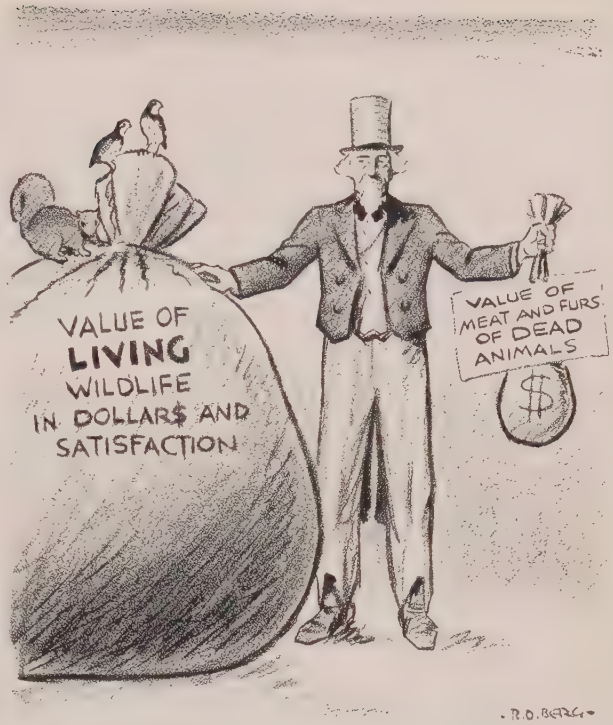
"In the 20-odd miles below the city of Haverhill, Mass., the Merrimac River had long since lost its attractive appearance, except from a distance; and on its banks had accumulated the evidence of the deep deposits of mud resulting from the years of discharge of sewage and industrial wastes from the industrial cities of Haverhill, Lawrence, Lowell, Nashua, Manchester and Concord. For several years, however, the industrial activity of the Merrimac Valley has been greatly curtailed; many mills have been closed or dismantled; and population has stood still or diminished. Then came the unprecedented flood of March, 1936, which, as if to atone for its destruction of property, scoured out many of the old mud banks or covered them deeply with sand, so that clean, sandy shores in many places replaced the noisome mud that had so long been tolerated.

"Not only did this transformation please the human beings who lived near or had occasion to pass along the river banks, giving them visions of the restoration of the pleasurable usage of the once beautiful tidal estuary from Haverhill to the sea, but also it met the approval of the fish, which promptly repossessed this stretch of water, so recently devoid of life except for the sea-gulls which found it productive of choice morsels of refuse. Thus, in the short time from spring to summer, the Merrimac River threw off the evidence of long years of abuse.

"But the hope of permanent change was short-lived, for the natural cleansing of the flood could not endure while the causes of pollution remained. Industrial activity has resumed to some extent during the past year, and its wastes have again been added to the domestic sewage which pours into the river. Something happened one day in the fall of 1936. Either the capacity of the river had finally been exhausted, or some upstream industry had momentarily dumped a large quantity of poisonous wastes. In any event, the fresh, sandy shores of the river were suddenly strewn with the dead bodies of thousands of disillusioned fish, and opposite the mouths of small brooks flowing into the river could be seen dense masses of fish, headed inshore and struggling to get life-giving oxygen from the purer waters of the tributary streams, but doubtless doomed to join their recently deceased brothers on the beaches.

"Here had been demonstrated the full cycle of river history from dire degradation to pristine purity and back, all in the short span of a few months. 'So what?' you ask. Well, at least it shows that Nature can, and given a chance will, give back the beauty of our rivers in a surprisingly short time; and, per contra, will have little patience with us if we do not reciprocate."

We are glad to publish this important contribution to conservation by Mr. Spears, a life-long advocate of reasonable enjoyment of outdoor wealth, and President of the American Trappers Association. The reader will note that the author bases his thesis on the condition that protection during eight or nine of the twelve months shall be genuine. He has, therefore, made little reference to the influence exerted by commercial and sporting interests. We know, however, that he is fully aware of the heavy share of responsibility that rests on commercialism in the destruction—amounting to threatened extinction in many cases—of a large proportion of our wildlife species. Wholesale destruction of predators by poison or otherwise; persecution of so-called "vermin"; stimulation of sales of guns and ammunition; over-exploitation of mammals for fur; the supposed necessity of encouraging blood-sports irrespective of the stock—all these have no part in the program he advocates.




# Do We Fight for Fun—or What?

*By* RAYMOND S. SPEARS

It is to be wished that Nature lovers, scientists, sports people, professional hunters and trappers, and all those definitely concerned with the birds and mammals, the coverts and the open country, could get together on all points on which they agree. The rich concerns of Nature cover a full twelve-month year. As regards wilderness affairs, are we not all agreed that spring, summer and early autumn—some nine months of the year—should be dedicated to protection?

This is seventy-five per cent of the problem of conservation. Let us all agree on this period. From the time fur fades, sheds, and the courting season begins for most fur animals, in late January, trappers, who are professional wildcrafters, would be glad to have care taken of the high altitude wildlife, and the creatures of the green timber and the wilderness generally. Muskrats and beavers, becoming prime in certain marsh and restricted areas a bit later than the other species, could be given a slightly different treatment.

So from February onward we could get together, all of us. Let the wild creatures go about their wilderness affairs in peace from February through September. Here are eight full months during which no one can say with justice that restriction would harm him. The trappers who in February take up a few pelts thereby keep the wilderness creatures in a turmoil. Disturbance in February probably reduces the number of young by a third or a half. And this cuts the next year's catch thirty to fifty per cent or more, and the furs taken in February reduce the value of that season's take because of faded, worn and shedding pelage. Certainly a short-sighted practice.

Sportsmen have everything to gain by restricting the killing of game and the non-game meat and "hide" animals to the season for prime wild meat. All the animals killed for sport are in their best condition from about October 1 to November 15. This is true of waterfowl, waders, upland game birds, the deer, bears, and other big game. To destroy deer in August, even in September, wastes not only the meat, which spoils, but the savor, which is at its best for only about six weeks in the autumn.

Several of the larger mammals, bears, cougars, wolves, coyotes, wild horses, wild jacks, are in a class by themselves. All of them are fine food animals—the cougar, young coyote and beaver tail were favorite meat for the old time trapper. But not one of these animals is good eating until the prime meat season—in October. And their skins are practically worthless until the very end of the prime meat season in November.

For fur, or leather, or rugs, no animal should be killed before the hide is white, thin, and firm. Thus when deer and moose are killed for meat before November, their hides are almost worthless. Moose skin leather from thick, spongy blue hide will last in moccasins for snowshoeing only a few days. The same skin, thin and tough, killed in early or at best late autumn will last in moccasins all winter on a trap line. And I suppose the reason leather and wild hides are usually sold by weight is because the heavier they are the quicker they wear out in service.

Now the prime meat season is six weeks, October 1 to November 15—and unfortunately this extends fifteen days into the mating season for the noble deer. But a strict maintenance of the season to the six weeks would

allow for rapid increase in the number of deer. In Pennsylvania a good deer law, carefully enforced, brought back the wild deer supply from below 4000 in 1901, to a point where 67,000 were killed in a state some 44,000 square miles in area. Some states get a deer to each five or ten miles of producing area. New York and Pennsylvania, where, as the figures show, the people are more practical, get more than two deer per square mile of deer country.

The best fur season, when the pelage is prime and full, lasts only about six weeks, from December 1 to middle January. Furs caught in this period are worth nearly twice as much as the same number caught through three months.

A wildcrafter, speaking for trappers and hunters, need only pay his respects to the Nature lovers who go into the field with camera, notebook, handbook and binoculars. They are recognized as friends by the nesting birds, and the mothers of fawns are unafraid of them. Bears in the National Parks become familiar, even insolent, on occasion. In the wilderness I can see no reason why the unarmed man, woman, or youngster should not have the freedom of all the land at all times.

The human habit is to find some point for argument and combat. We agree on the need of Conservation. We are together—sportsmen with Nature lovers—for all but six weeks of the year. Trappers shoot game in autumn, as part of their food supplies. But as regards the fur-bearers, only six weeks of disagreement with the Nature lovers could be allowed even trappers.

So we have six weeks for hunting and six weeks for trapping—and for nine months we are agreed. Instead of nagging one another all the year we could get together on the seventy-five percent of the year when we agree. And while the trappers are in the woods in the prime fur season, most of the legislatures are in session, and their representatives, I am sure, would welcome laws to give force to the marvelous pronouncement of the U. S. Biological Survey in a study of Jackson Hole area wildlife, that "coyotes have a sentimental value", and agree to support Conservation during the nine months when protection is vital. Then we could compromise on the game and fur seasons. I question whether there is a single kind of game or fur animal that ought not to be protected in most places for at least five years, with the possible exception of rabbits, hares and muskrats. We could at least agree to nine months' protection, instead of no protection at all, for innumerable species that poison and firearms salesmen are most earnestly seeking to exterminate for profit.

The need of Conservation is vitally urgent. Probably more than a score of game and fur species already face oblivion. Several species of ducks, geese, and swans are almost gone. Sportsmen stand to lose all shooting, trappers all their winter-month occupation, and many homesteaders the winter meat that they could have if the larger animals were abundant in proportion to wild area, but who are now starved out from many areas by stupidity, folly, and greed for quick profits. California is said to import annually $1,800,000 worth of ammunition, and no one knows how much of poison, to kill $500,000 worth of fur and game.

We use our arrogant individual stupidity instead of our united intelligence and understanding. We pay incredible toll, tribute, and loss in our lack of conservation action. We brag about our pioneers who "conquered the wilderness", and imitate them, instead of working with Nature.

It is a fact that no country has ever come into its own as a recreation land until people who love wildlife—ten times as numerous as the killers—could go into the fields and mountains and valleys and see it running free and safe, and not have their hearts torn by the spectacle of lovely creatures blasted down. Today, in Wyoming, northern California, Nevada, Colorado, Idaho, Montana, Oregon and Washington—wherever an antelope is found—it is worth $1000 as a live attraction, compared to $20 as dead meat; a mountain sheep is worth $5000 alive; and elk and deer, all the species, are worth from five to fifty times as much alive as dead. Consider the advertising value of live bears! Of the concert singing coyotes of the wastes!

And those wild horses, of the big game animals, visible from a highway, are worth a hundred times as much as tourist attractions as they are when canned for dog food. These wild animals are the only possible way of making many thousands of square miles of wilderness land in the United States pay an income in animal products.

But, no, our people must poison the fur animals and *their* food supply. They even destroy the animals that dig the aqueducts down which the rain and snow waters pour into the subterranean "water table" that alone insured crops by "dry farming". And in the pastures they poison

the little gardeners whose burrow mounds are the only places where the forage can grow, where the bunch grass thrives.

Those burrow mounds were mulched, seeded, fertilized, and (by the water tunnels) irrigated by the burrowers, from badgers to gophers and chipmunks and prairie dogs and rabbits. Creatures growing tons of meat to the square mile are poisoned and blasted to death to make way for creatures that yield as little as *nothing*. And having skinned the wild beaver from all those innumerable streams, east and west, where erosion is a national calamity, we set tens of thousands of boys to building dams at enormous cost. These same boys would have been fed and educated and occupied by the returns in dollars paid in their pelts by the beavers for the privilege of building reservoirs for humanity.

If we stopped for five years all hunting, all trapping, all wildlife poisoning in all the wilderness and marginal land areas where domestic occupation has proven to be more costly than its returns, and took care of all the people who now gain by wildlife destruction, even to spending $250,000,000 a year to give the killers for sport an equivalent for their souls, we would reestablish fur and game and wild meat incomes alone—even excluding fish—that would pay a rich return in cash, not to mention the inestimable values of education, of affection, of observation, of wilderness experience for our students, observers, listeners in the outdoors—in our great, glorious country.

All the children of the marginal and wild lands in the west, all the young people born on such lands to "build up the country", could be educated for life by the simplest methods of Conservation. And we are destroying the Garden of Eden in order to live by the sweat of our brows and the ache of our hearts!

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# ASPENS of Abajo Peak

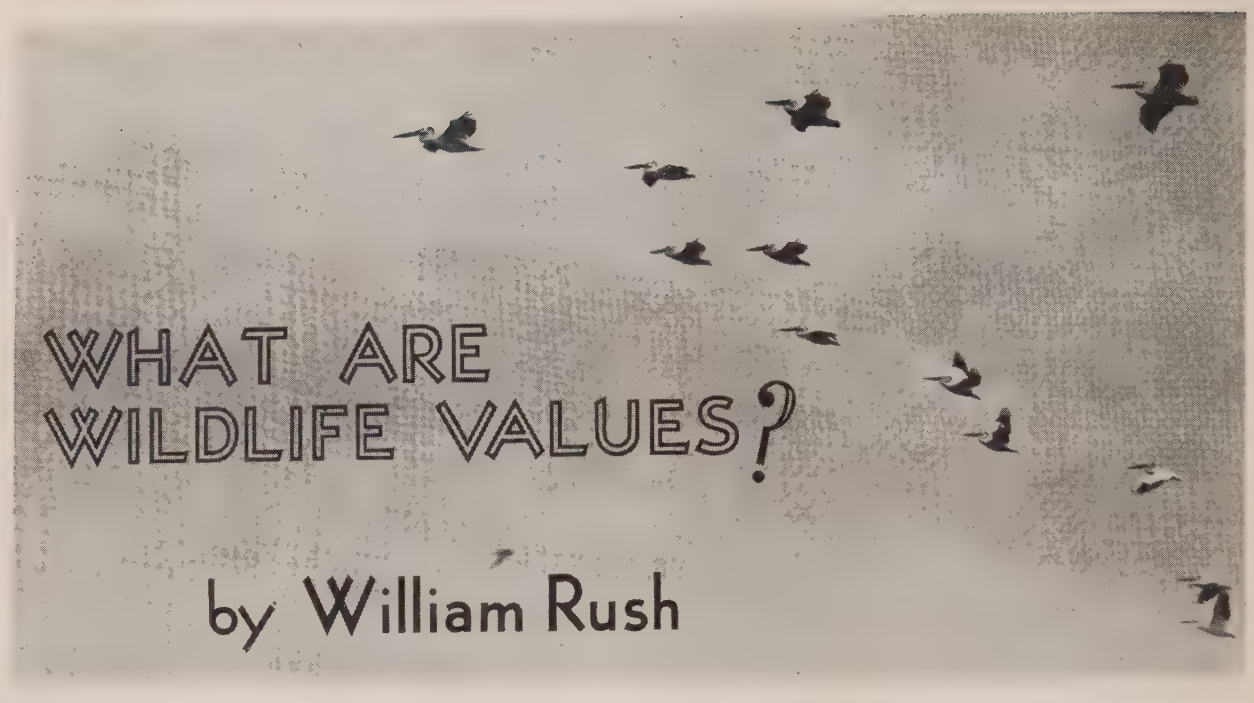
*By* M. W. JONES

COMBATTING THE FORCES OF NATURE

Resisting the rigors of alpine weather, these aspens are maintaining an existence on the slopes of Utah's Blue Mountains

NEAR the foot of Abajo Peak, in the Blue Mountains of Utah, lies a glade of aspens that give one a weird feeling. It is as though he were viewing the havoc wrought by some mythical giant who had here indulged in a spasm of ungovernable rage. Gnarled, twisted, distorted, like the limbs of a survivor of a medieval torture chamber, are the grotesque, misshapen forms of the trees. Indeed, so sinister is the aspect of this glade that one entering it at twilight, as did the writer, can scarcely fail to experience an eerie sensation. It is a feeling of momentarily expecting these menacing trunks and branches to spring into action and strike at him or crush him in their writhing coils.

A casual, unimaginative glance at the accompanying photograph might readily lead one to pass it by with some such commonplace comment as, "More timberline trees, again." But no! True timberline trees, in this latitude, are evergreens, not aspens. Moreover, while their fantastic shapes are largely determined by the wind, their size and the limiting altitude at which they grow are mainly dependent on temperature conditions. Nevertheless, this particular group of aspens, some three or four thousand feet below normal timberline, does constitute an outpost stand. The whole top of Abajo Peak has the general character of a coarsely-broken, barren rock-slide, resembling somewhat the ruins of a pyramid, or even more closely the "boulder-field" on Colorado's much-climbed Long's Peak. This aspen glade, near the lower edge of such a rough cone of rocks, is fully exposed to the untempered blast of the wind and to heavy accumulations of snow in winter. These conditions, together, undoubtedly account for the distortion of the trees. One can hardly fail to be stirred by a thrill of admiration for the unconquerable persistence of these aspens, a species not ordinarily exposed to such harsh conditions, in the face of such grim odds as the forces of Nature here impose. The steadfast purpose of all high-altitude trees is ever a source of wonder and inspiration.



# WHAT ARE WILDLIFE VALUES?

## by William Rush

A GREAT deal is being said about the values of wildlife, about what it means to the American people to have in this country an abundance of wild birds, mammals and fish, but usually little or no value is assigned to the non-game species. In the current literature and in the many speeches that we hear on this subject there are usually enumerated four separate and distinct values of wildlife, namely, economic value, recreational value, educational value, and esthetic value.

Usually the greatest stress is given to the economic value of the great array of species of wild game creatures still inhabiting this continent with the human race. Many sharp pencils have been worn dull by the experts in computing the dollar and cents value of our "wildlife resource", as it is most frequently called. There are so many men, women and children who buy hunting and fishing licenses in the United States, and their expenditures amount to so many dollars. These hunters and fishermen purchase so many dollars' worth of equipment, clothing, ammunition, food, gasoline for cars and services of guides and others. It is stressed that the transportation companies automobile manufacturers, boot and shoe factories, outdoor magazine publishing companies, all contribute to make the wildlife of the United States a billion dollar industry. Even the paltry value of the meat of these animals as a food resource is given much importance.

All this is true, but, in our zeal to put the dollar mark on everything, we are losing sight of the real, more lasting values derived from the wild things of field, forest and waters. Our writers and speakers are likely to exhaust their energies on the economic phase of this matter, and then, as an afterthought, add something about the other benefits to be derived from wildlife.

If we accept the definition of "value" as "the property or properties of a thing in virtue of which it is useful or estimable", then the time-honored list of values of wildlife named in the old order of importance as economic, recreational, educational and esthetic should be reversed.

Esthetics is the science of the beautiful in Nature and art. The appreciation of grace and beauty is latent in all of us, even in the most hardened hunters and fishermen. It is hard to find a person who is not thrilled by the grace and beauty of a mother deer with fawns, by the sight of a covey of quail, a leaping trout, or one who is unmoved by the eternal mystery of Nature when he views the spring and fall migrations of waterfowl.

The white pelican is condemned and persecuted by many hunters, because of its fish diet, but investigators have known for a long time that the pelican feeds upon

**For a number of years William M. Rush has been associated with the Forest Service in the West, much of the time in the Yellowstone Park Region. One of his major duties has been the study of wildlife, particularly of the larger mammals. He is now director of wildlife management for the Biological Survey in Washington, Oregon, California and Nevada.**

**It is evident from this article that his long and intimate acquaintance with animals in their native haunts has resulted in the development of a broad and sympathetic attitude toward them. It is also plain that he does not agree with those who deny the possibility of maintaining a fair balance of Nature, merely because the original balance has been upset in many places, mainly because of our own ignorant and faulty viewpoint.**

**We are particularly pleased to note such a wholesome attitude in one who occupies so important a position. Such a policy as this, put into practice throughout our continent on a long-range basis, would soon restore to their own our depleted outdoor resources.**

the poorer scrub fish, rather than such game fish as trout or bass. But the fishermen of this great nation could well afford to sacrifice a few game fish from their own creels for the sake of this interesting and beautiful bird. Its flights between lakes and feeding grounds in the prairie country furnish a striking and beautiful break in the monotony of the vast expanse of blue skies and unbroken plains. These birds are never found singly; they are essentially communists. What one of them does, all do, even to beating their wings in rhythmic unison as they fly.

The great blue heron, too, is subject to the most dishonorable and senseless persecution because of its reputation as a fish stealer. The thoughtless hunters who use it as a target to test their marksmanship disregard its usefulness in destroying the reptiles and mice that make up so large a part of its diet, just as they are blind to the other virtues of the bird.

The heron has furnished inspiration to poets and artists alike. Longfellow, Lowell, and Tennyson sing of the beauty and mystery of the bird and its surroundings, while Japanese artists have used the heron and its allies so extensively as subjects that the sight of a heron in flight, with outstretched neck, long, dangling legs, and wide sweeping wings, reminds us primarily of a Japanese print, plaque, or screen.

Sea birds give life and beauty to the ocean. The picture of any shore line would seem empty without the white curve of the sea gulls, the darting flight of terns. So many things in Nature have that spiritual, inspirational and esthetic value that it would be a waste of time to attempt to enumerate them all.

When we stop to think—it is the things in this world like air, water, sunlight, friendships, the taste for good literature, art, the appreciation of graceful and beautiful things that really make life possible, and delightful if you will. None of these good things can be evaluated in money. Most of our wild creatures have that assemblage of graces pleasing to the eye, ear and intellect that we call beauty. They have that beauty of action and form which we term gracefulness. Life is much better on this earth because of the presence of these wild things that delight and please us by their mere existence. Surely the esthetic value of our wildlife should be given first place in the scale.

This osprey on its nesting butte in a western desert, and this wild bear, so unafraid in its natural haunts, are worth a hundred times more alive than they would be if dead.

The educational value should be second. A man well educated in the life histories, habits, physiology, psychology, inter-relationships, ecology, evolution and other facts concerning wildlife would know more than all our present-day literature contains on these subjects. No one person, in the ordinary span of life allotted to mankind, can hope to learn more than a fragment from this branch of Nature's book of knowledge. When all is learned, then the riddle of life itself will have been solved.

The educational value of our various species of bears is incomparable. The habit of hibernation alone would furnish a wide field for investigation, enough to fill the lifetimes of several able naturalists. Interesting comparisons may be made between species of bears, and even the individuals among them differ so widely in their temperaments that they are a never-ending source of interest and amusement to the Nature student.

There is hardly an art or science known to the human race that could not be greatly benefited in one way or another by more complete knowledge of what we term the lower animals. Every form of lower animal life possesses at least one faculty, and some forms many, that are superior to the same powers in the human family. There is only a small gap in the scale of intelligence between those races of humans lowest in the scale and the wild creatures highest in the scale. In fact, when our knowledge is more complete, it may be shown that there is a lap in the scale, instead of a gap.

If we place the recreational value third, between educational and economic, we will not be far wrong. Recreation is the refreshment of body and mind. It implies a temporary divorcement from the ordinary routine of life that will result in an improvement of the physical and mental faculties. For the hunter or fisherman it begins with the planning and purchase of the equipment necessary for his trip to field, forest, or stream, continues through the

These Caspian terns, photographed by William L. Finley, lend vibrant life to what might be a scene of desolation

planning and execution of the trip to the hunting or fishing grounds, and culminates with a full bag, camp fire stories and good fellowship in the wilds, even carrying over into refreshed energies for his return to the old routine.

The camera-hunter and the wildlife student find much pleasure and recreation in viewing all species, game and non-game, shore and water birds, squirrels and chipmunks. Whether the record they carry home be on photographic film or merely a memory picture it stimulates them to go again and again to the woods and fields.

No one can deny the recreational value of our wildlife in luring a great part of our American people to the wilds in the great outdoors, in teaching them the art of taking care of themselves and building within them stronger minds in healthier bodies. It is a true value, even if it cannot be measured directly by financial gain.

We can, however, measure the economic value. It is entirely possible to estimate, if not practicable to count, the numbers of every wild species in the United States and arrive at a definite price figure for each, alive or dead. It would be a tremendous sum, equalling or exceeding the investment in many important American industries. After all, dollars are necessary in our modern civilization to make progress along any line of endeavor and "dollars" is a word that every one of us understands. Perhaps it has a greater appeal to a greater number of our people than any other single word in our language, and no doubt more immediate good will result to the wildlife of this nation through the iteration and reiteration of this one word than from all the quotations of all the philosophers, or from any amount of reasoning along other lines.

There are, of course, certain species of both birds and mammals that cannot be kept in thickly settled communities. For instance, no one would advocate keeping rats or mice in a city, or English sparrows in such large numbers that they crowd out all other birds. There are also certain predators, such as the coyote, that are too destructive to keep in large numbers around a farming or stock-raising community.

In the city we trap moles or mice in our gardens and around our ornamental shrubbery, and in a similar manner the farmer or orchardist finds it necessary to control certain species of mammals, such as ground squirrels, chipmunks and mice, that do excessive damage to his property. Certain species of birds also are so injurious to other species that their numbers must be strictly limited in certain localities.

It is absolutely necessary for mankind to assist in maintaining a balance in our wildlife species at the present time because it has been so sadly and irreparably disturbed by

man's occupancy and use of the large area formerly wholly a habitation for wildlife. It is only a matter of common sense to take some measures to limit certain species, even though individuals of these species are highly desirable from the esthetic or the educational standpoints.

It may be maintained that educated men, with an appreciation and love of the beautiful, have done more than any other class for the advancement of civilization. If such a man has a physically sound body and a clear brain he is, of course, capable of doing more. If he has wealth at his command he can do his best. As the man with money and nothing else, however, has done the least of all toward the advancement of civilization, so it is the man who places the importance of the dollar above everything else who will do the least for wildlife in the long run, or for human enjoyment of wildlife because of its recreational, educational, or esthetic values. This writer maintains, therefore, that the proposed reversal of old ideas regarding the order of importance of wildlife values at this day and age, when our wild creatures are facing pitiless extermination from the earth, is basically sound. Widespread recognition of this fact and its application to wildlife activities are vital.

A tame Yellowstone Park coyote poses for the camera

# Relief and Rodent Control

It has been several years since the extensive use of poisoned baits to control wildlife has been widely advertised and eulogized. From time to time, however, there have come indications that the vast sums that have been expended by the various relief agencies have furnished opportunity for increased activity in selling and distributing poisoned grain. We have scanned the pages of many reports of relief projects, hoping to gain further light on this important subject. Here and there, the supposed values of control operations as contributors to material wealth and character-building are stressed, but the harmful features are never mentioned.

Poison, nevertheless, placed where it can be found by large numbers of wild creatures, is almost universally recognized as a major menace. As generally used, it is highly non-selective—that is, others than the intended victim are likely to consume it. Naturally this danger increases with the quantity used, and with the lack of care that necessarily accompanies its use in large quantities.

The extensive use of poison for the control of predators and rodents is opposed by naturalists, who are convinced that it destroys innocent species, and that, by the robbing of the smaller predators of their natural food, these creatures are likely to become a menace to poultry and small game. Fur-trappers oppose poison on the ground that it results in the wasting of valuable fur-animals. Many farmers refuse to permit its use, for dogs especially are frequently its victims, and horses have died from poison carelessly left on the range. The humane societies attack its use for various obvious reasons. In a number of instances, human beings have died because poisoned grain has been cooked by people ignorant of its character. Most of these casualties result from the use of poison in large quantities, the very circumstance that wins the warmest approval by its proponents. It is noteworthy that recognition of the danger of poison used for the capture or control of wild creatures has been so general that the legislatures of many states have long forbidden its use, under varying circumstances, and subject to suitable penalties.

On the whole, wildlife control by the various relief agencies operating during the past three years has not been much advertised.

Not content, however, with doing the work, the guiding agency must now laud its accomplishments. A late instance takes the form of a mimeographed release entitled "Rodent Control Aided by Emergency Conservation Work", issued as Wildlife Research and Management Leaflet BS 54. Its author is Stanley P. Young, Chief, Division of Game Management, Bureau of Biological Survey.

This leaflet is no ordinary release, for twenty-two of its thirty pages are reproductions of photographs showing how prairie dogs, ground squirrels, pocket gophers, kangaroo rats, rabbits and hares, and porcupines damage our western countryside. We believe it is the most elaborately illustrated brochure issued under "Wildlife Research and Management" auspices, and as such it seems a sorry exposition of this important subject.

The extent of the poison operations may be judged by the following quotation:

"When the Emergency Conservation Work Program came into being, the Forest Service, the Bureau of Indian Affairs, the Bureau of Reclamation, the Division of Grazing, and the Bureau of Biological Survey took the opportunity to treat a vast acreage that would have been treated years ago had funds permitted. During the three fiscal years 1934 to 1936 a total of almost 20,000,000 acres have been covered by ECW for the control of these

various rodent pests. On the statute books of several Western States rodent-control laws provide that landowners may establish rodent-control districts wherein all lands are treated simultaneously by paid crews working under the supervision of the Biological Survey. Never before the ECW program were there adequate Federal funds to make these laws effective by taking proper care of infested public lands adjacent to private holdings."

Evidently the qualifications of a good poison operator are not severe, if boys who are found unsatisfactory in other lines of work do it so well. Concerning this point, we read:

"Rodent control is one of the most popular projects with ECW enrollees themselves as well as with the local people benefited. In many cases, crew foremen supplied by the Survey took boys who would not work satisfactorily on any other type of project and made real hands of them on rodent-control crews. The boys liked the work in these crews, as it afforded them opportunity to become acquainted not only with methods of rodent control but with the various habits of wildlife as well."

The conditions under which these boys learn wildlife habits are plainly far from ideal, but to our minds one of the more serious faults of this leaflet is the implication that rodents are chiefly responsible for the barren condition of the areas shown in the illustrations. To be sure, the responsibility is divided, if one examines the text. Thus we find the following statement:

"Livestock and rodents together, during dry periods, have in many places almost entirely denuded the surface soil of its vegetation. This has caused the beginning of sheet erosion in areas where there would still be ample forage for livestock had it not been for the excessive numbers of rodents. On many areas, grazing by livestock and rodents combined has practically eliminated the native grasses, and these are now being replaced with weeds and poisonous plants."

There is much truth in this statement, but by the photographs one is led to believe that it is the rodents that have been the deciding factor. Anyone who has seen the destruction of whole landscapes by erosion following excessive grazing by sheep will find it difficult to agree with this view.

John H. Baker, Director of the National Association of Audubon Societies, in *Bird-Lore* for March-April, 1937, has an excellent discussion of this leaflet. In this he points out that the use of poison by relief agencies goes much farther than is indicated in the Biological Survey release. The extent to which poison has been used in certain states, and the ease with which administrators learn to explain complicated situations, are well shown in the following paragraph from *Bird-Lore*:

"Biological Survey Not the Only Culpable Federal Agency—About a year ago the Secretary of the Interior approved an ECW poison project in Arizona and New Mexico involving distribution by CCC boys in 22 camps of 430,000 pounds of poisoned oats bait and 21,000 ounces of strychnine alkaloid. At that time the Audubon Association made strong protest to the Secretary and received the following reply, signed by Mr. Harry Y. Slattery, personal assistant to the Secretary: 'The Division of Grazing of this Department has inaugurated a broad forage conservation and range development program in the Southwest through the medium of CCC camps. This program involves mainly construction of stock watering-places and other improvement activities. Rodent-control work also is being undertaken, but only on ranges which are heavily infested with herbivorous rodents and where the natural balance of vegetative growth and soil fertility are being disturbed thereby. This work is outlined and supervised by experts and every precaution is taken to prevent injury to other forms of wildlife and domestic animals. It is the purpose of this Department, in the administration of public grazing-lands, to promote the best public interests in all natural resources and a proper wildlife program is being given careful and considerate attention.' A masterpiece of applesauce," says Mr. Baker.

Mr. Baker goes on to discuss the one-sided views that boys will inevitably absorb through wildlife work that consists mainly in dealing death by poison; the rôle of rodents in soil-building; and the natural controls of rodent over-abundance—flesh-eating birds and mammals. He further recommends that poisoning by Federal bureaus be stopped, and that instead, the government concern itself with research that will lead to wise conservation policies. Moreover, he urges active pressure on legislators to effect such programs. And in these recommendations the American Nature Association concurs.

We have recently learned that plans are brewing for a rodent-poisoning cooperative project in California, on a scale that promises to devastate the State. Concerning this, we purpose obtaining fuller particulars. Friends of wildlife will fight this poison menace to a finish. If the battle is delayed a little longer it will be too late.

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On May 26, the Senate passed bill S.1791, authorizing the Secretary of the Interior to acquire certain sections of land bordering Yosemite National Park, California, containing the finest stand of sugar pines in the world. Thus the battle to save the California sugar pines has moved into its final stage, with conservation forces victorious in the first skirmish. The measure was immediately sent to the House for consideration. Under terms of the bill, all lands acquired shall become a part of the Park, thus preserving for all time these magnificent trees. (See Nature Magazine, June, 1936, Page 363)

# Things to Think About

THE following resolution, adopted April 27, 1937, by the Board of Directors of the National Association of Audubon Societies, merits the support of all individuals and organizations interested in conservation of wildlife. The resolution, which, we feel, requires no elaboration, reads:

INASMUCH as there is widespread current use of miscellaneous poisons by Federal, State and private agencies in efforts to reduce the numbers of certain wild animals,

INASMUCH as there is ample biological evidence that the maintenance of a normal mammal population, in relation to its environment, in natural balance, is conducive to the economic benefit of mankind,

INASMUCH as the programs of soil conservation, flood control and range improvement, among others, would seem to require for their successful consummation the maintenance, in the problem areas, of a normal native mammal population,

INASMUCH as there has been in recent years an enormous expansion in the volume of poison distributed in the United States to control mammals, primarily because of the availability of the personnel of the CCC as distribution agents;

THEREFORE the National Association of Audubon Societies recommends and asks that:

1. The practice of poisoning native wild mammals by Federal and State agencies be discontinued except where thickly settled communities may be demonstrated to be in danger of a plague epidemic affecting the mammal population of the area.

2. That private agencies be discouraged in the use of poison as a control medium and that the practice of control by such agencies be limited to areas which are under cultivation, including a reasonable but limited buffer zone.

3. That Federal and State agencies be urged to initiate comprehensive research programs to determine all obtainable facts concerning the relationship of the rodents and predatory animals to the soil, vegetation and the use of the land by man.

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Impetus to the development of farm woodlots is given in Wisconsin through the simplification of the law enabling the farmer to win tax exemption for the parts of the farm devoted to timber production. The change in the law eliminates the necessity of mapping the lot so designated and merely requires fencing sufficient to keep farm animals out of the section.

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Expressing his appreciation of our article in the May issue on "Roadside Menageries", J. Seth Jones of the Connecticut Humane Society calls our attention to the fact that there are no roadside zoos in his State. The reason is a law that says that "any person who shall exhibit any wild animal in connection with any business for the purpose of attracting trade upon any street, highway, or public park, or at any fair, exhibition or place of amusement, recreation or entertainment, or shall own, keep or have in custody any animal, reptile or bird for any such purpose, shall be fined not more than one hundred dollars or imprisoned not more than thirty days or both." Connecticut shows the way. Let us hope that the procession of states with similar laws will grow rapidly.

Robert Marshall has been appointed Chief of the Division of Recreation in the United States Forest Service, leaving the post of Chief Forester of the Indian Service to accept the appointment. He will carry to this position the splendid philosophy of the outdoors expressed in his article on the wilderness in our April issue. We congratulate the Forest Service on this acquisition.

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Lee Fisher, graduate student of Michigan State College, has been conducting partridge investigations for the State Department of Conservation. Around the camp in the Pigeon River area were more than twenty house cats, many of them abandoned strays. An incidental study of their habits was made, and examination of the stomachs of cats shot showed evidences of four prairie chickens; about six horned larks; eggs and young from horned lark nests; a snowshoe rabbit; a cottontail rabbit and two meadow mice. The unrestrained cat is a menace to bird life.

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Despite the fact that the Vinson Bill (H.R. 2711) provides no means whatever for effective pollution control, the measure has passed the House by a vote of 187 to 121. The bill now rests in the Senate Commerce Subcommittee, with Senator Caraway as chairman, where it is hoped the members will work to block this measure and substitute the Lonergan Bill (S. 13). The very fact that the Vinson Bill has had support from industrial interests that generally oppose such legislation should be enough to convince the Senators that the measure is ineffective and would not be the solution to America's pollution problems. The Lonergan Bill, on the other hand, supported by every national conservation group that has considered the measure, provides for actual pollution control and does not merely authorize millions of dollars to be spent for more pollution "surveys."

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Wildlife and plant species threatened with extinction will be protected in National Forests as a result of an amendment to the National Forest regulations promulgated by Secretary of Agriculture Henry A. Wallace. The amendment provides for the setting up of "Vanishing Species Areas" within Forest boundaries. Dr. H. L. Shantz, chief of the division of wildlife management of the Forest Service, illustrating the value of these areas, pointed out that a particular case in point was the California condor. He said that under the new regulations the limited areas in the Los Pedros National Forest in which these birds live will be closed to "intensive human use" in order to give the species a chance to multiply.

The Mud Lake area in Marshall County, Minnesota, is being restored as a migratory waterfowl refuge by the Biological Survey. A recent executive order sets aside 55,170 acres ultimately to be acquired for the refuge and names it the Mud Lake Migratory Waterfowl Refuge. This area was a victim of drainage operations earlier in the century, but the net result was a series of peat fires and the destruction of vegetation that had provided food and cover for waterfowl, for, after draining, the land was found unsuited for agriculture.

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That the schools of the country, with their enrollments of tens of millions of learners, should become the most important ally of the agencies primarily interested in the conservation of our national resources is urged by Commissioner of Education J. W. Studebaker. The schools, he said, already are giving some attention to conservation in connection with various science and social study courses, but the "work needs to be greatly expanded, vitalized, and integrated to the end that pupils in the schools may approach adult citizenship with a much clearer realization than now obtains not only of their responsibility but of the real opportunity that exists for them in conserving wildlife, forests, land and soil, oil and minerals, and the even more important fields of health and human life."

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We note with interest the publication, in book form, of a history of the American Game Protective and Propagation Association, founded in 1911 by certain arms and ammunition interests. Under the heading "Financial Support," the Association says: "The greatest praise is due the manufacturers of arms and ammunition for their generous contributions to the Association during its 24 years of active work. . . ." With this section, and extended lists of conferences and advisors, the Association closes its case, leaving the uninitiated to suppose that the game thereby has been "protected". But the uninitiated are not so trustful as they were in 1911. They know that the period between 1911 and 1937 has been signalized by the greatest orgy of game-killing, the world over, that this planet has ever experienced, or can.

While the Association, in its early days, was sponsored by many earnest workers and did good work in helping in the passage of the Migratory Bird Treaty Act, we cannot share its enthusiasm in the part it took in several other enterprises, notably the series of efforts that culminated in the Federal Duck Stamp. This bit of strategy, by seemingly making impossible the closing of the waterfowl hunting season, is hastening, rather than retarding, the extermination of a number of valuable species.

Although the Game Association launched in 1930 what it called an "American Game Policy," this has not proved to be a workable one. We fear that the reason lies in the fact that the Association, which some years ago left the words "protective" and "propagation" out of its title, and now has become merged with the American Wildlife Institute, has always been more interested in killing than in protecting.

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Schools throughout the nation could well follow the example set by the Roosevelt High School, Seattle, Washington. A manual entitled *Be Conservation Conscious* has been prepared by the "Minute Service Boys" and is being issued to the students in the hope that each one will become active in furthering conservation ideas. The pamphlet contains a condensation of *America as God Made It* by Donald Culross Peattie, and a list of living things that need protection. One slogan of the "Minute Service Boys" is *Let Our Foul Fly Free Through the Forest.*

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Since October of last year, eleven more small refuges, totalling 103,000 acres, have been established in North Dakota by the Biological Survey, looking toward water conservation and migratory waterfowl protection.

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The Agricultural Appropriation bill has passed the House with no increases made for forestry management or allied subjects. Carrying out the thought expressed in President Roosevelt's economy message of April 20, the House refused to accept amendments that would increase the amount appropriated in the bill. Representative Luckey of Nebraska proposed an increase of $100,000 to provide for the establishment of the Great Plains Forest Experiment Station, originally approved by the Bureau of the Budget, but the amendment was quickly voted down.

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The Conservation movement is rapidly spreading throughout the schools of the Nation, and the need for its continued growth is a pressing one, for in a few short years today's youth will take over the reins of Government. One of the objectives of the Student Patriot League, founded just two years ago in a Minneapolis high school, is to "advance sound policies for conservation of natural resources". Students everywhere are urged to form local chapters of the League in their schools. Full information can be obtained from League Headquarters, 309 Pence Building, Minneapolis, Minnesota.

GARDENS SHOULD NOT BE FORBIDDEN SANCTUMS

PHOTOGRAPH BY ZARAKOV

Although the impulse may be to pick every posy in sight, the youngster can be taught the fundamentals of conservation as soon as he is able to dig in the ground with his toy shovel and hoe

# The Child and his Garden

*By* MARIE EISENBRANDT

A CHILD in a garden! Can there be a lovelier sight? The flowers seem to blossom more gaily when a baby stoops to smell them. But wait until the toddler reaches for the bright-colored blooms, pulls the tops off the opening tulips, tramples on the hyacinths, and marches indoors, proudly displaying a fistful of unopened buds!

At such moments the garden-lover is all too prone to become irate and unreasonable; to forget that it is as natural for the two-year-old to pick the bright blossoms as it is for him to breathe. They are lovely and cheerful and gaily-colored. Whether dandelions or delphiniums he sees no difference between them, and both invite picking. So he obeys his natural impulse and—pulls buds without stems!

Only when he has learned to love the garden will he leave them alone. To teach him this you yourself must love both the child and the garden. The growing of flowers and plants will then become a source of deep mutual joy, whereas if you fail in your instruction the garden will become a "Don't" place, a definite "No No;" a land of forbidden delights to the child, a source of constant aggravation and anxiety to you.

One should begin when the baby is very young—between one and two. Give him a small pail and an old spoon. Where the earth is soft and unplanted allow him to pile dirt into the pail and pour it out again, time after time. Foolish, solemn play this may seem to be, but the baby is learning to handle his garden tools!

Another year and at two or three he is ready for his first experiment in planting. Before the actual sowing of the seeds begins he should have a miniature shovel, rake, hoe and watering can, and practical blue denim overalls and a small wheelbarrow. When he is capable of handling the different tools, a skill that children acquire with amazing rapidity, he should have seeds for planting. These should be large enough for small fingers to grasp without dropping; they should grow quickly lest the baby's interest lag before the plants appear, and they should be hardy enough to withstand the roughest treatment.

Bean, nasturtium and radish seeds meet these requirements. The round, crinkly nasturtium seeds are especially liked by children and their bright red and yellow flowers are certain to delight them. Show the child how to plant the seeds and then calmly accept the fact that those planted on Tuesday will be pulled out on Wednesday to "See how they growed".

It should be remembered that it is impossible for a youngster of three to conceive of the abstract fact of growth without the actual evidence of it before his eyes. You must therefore at this moment suppress your emotions as a gardener and realize that in a child's garden it isn't the flowers and plants but the child

that is important, that blossom and fruit are merely unimportant by-products, and the truly valuable crop is the sturdy brown body that comes from hours of working in the sunlight, the habits of routine and regularity that are established, the love for nature and all growing things that is certain to be awakened.

So let him pull up his seeds to his heart's content. Merely try to persuade him to bring one or two to maturity, that he may witness the entire cycle of growth and realize the importance of carrying a task to completion once it is begun.

The three-year-old will, of course, plant his seeds beside his mother's, but once he has reached the great age of five or six, he is old enough to be given a garden of his own and allowed to plant therein whatever he wants. It should be a small garden, not more than two or three feet square, located where the soil is good and there is plenty of sunlight; not in a shady corner where Daddy himself has despaired of raising anything.

Good, healthy seeds and bulbs should now be supplied, for they will undoubtedly be drenched with water for a few days and then completely neglected if a new litter of puppies arrive. Children, moreover, are small but severe critics, and when the plants blossom they will be satisfied only with the most beautiful flowers.

GANGWAY FOR THE TRUCK FARMER! PHOTOGRAPH BY ALEXANDER SCHULTZ

On the way to his mother's kitchen with a supply of fresh vegetables, this young gardener ran afoul of a buried rock, upsetting his produce

As to those actually selected—this is the child's garden and he should have whatever he desires. His ideas are likely to be charming and original, even if, in the opinion of a conservative gardener like his father, a bit wild. Mother and Daddy may help with suggestions but should make the child think that their suggestions are his own, and should give advice only when he asks for it.

As far as possible, try to direct his attention to plants that bloom continuously and need constant cutting so that he may enjoy a daily gathering of his flowers. Also suggest those that are hardy and easy to raise, such as marigolds, daisies, nasturtiums, pansies and snapdragons.

Colorful, fragrant and odd-shaped flowers have a decided appeal. Zinnias, poppies and black-eyed Susans meet the first requirement. Violets, sweet peas, roses and lilies-of-the-valley, the second; snap-dragons and canterbury-bells, the third. Small Margie will use the latter for dolls' hats, while Bobbie will delight in frightening you with a snapping dragon. Both will find the twin zinnia leaves pushing through the earth and the tiny frilled nasturtium leaves as exciting as the flowers themselves.

Also suggest something for its name and the story the name inspires, such as sweet-william, jack-in-the-pulpit and baby's breath. Recommend cosmos because the more you pick, the more it blooms; corn flowers, because the seeds are like tiny fairy paint brushes; straw flowers because of the nice crinkly noise they make; and the trumpet vine because the humming birds will go deep into the flower in search of a sip of nectar.

Sun-flowers will be favorites because of their rapid growth and towering height. Curious plants like wax flowers and the Chinese lantern plant with red balloon seed pods will also appeal to children. The obedient plant, whose flowers stay where they are put, affords opportunity for an amusing lesson in obedience.

Children of three or four are too young to plan a garden alone, but they can be directed in a selection that will provide flowers the year round. If this plan is followed, their interest will have no chance to lag because there is nothing new in their gardens.

Early in the spring, during the trying period of waiting for their own seeds to come up, supply the children with bachelor's button, forget-me-not and pansy plants so that they will have something to pick immediately. Pansies are a special delight. With their startling powers of imagination, children often see in them the faces of playmates, and may even name each flower after some older friend.

In the fall, direct the child's attention to the late blooming asters and the Christmas rose, *Helleborus*. Also provide a small evergreen that can be trimmed with crusts and suet as a Christmas tree for the birds, or equipped with electric lights for the children themselves, and which will soon be followed by snow drops and crocuses peeping through the ground, thus completing the cycle of the seasons. (Continued on page 58)

# Wildlife in the Flood Zones

*By*
JOHN W. MALONEY

ASSOCIATED PRESS PHOTOGRAPH

DEER RESCUED FROM THE FLOOD WATERS
Caught on a flooded island in the Mississippi below Memphis, the animals were ferried to safety

GEORGE ROGERS CLARK, from the wilds of the country now known as Indiana, wrote this interesting comment to his friend, Henry Pierce of Philadelphia:

"In this vast country now somewhat inconveniently flooded, game and all forms of creatures are to be seen everywhere, and I do honestly think there are some of all God's animals and birds here. Today I saw five deer and many smaller mammals huddled atop a round burial mound of the Indians, all waiting for the excess waters to recede."

What George Rogers Clark would have thought and said had he seen that same Indiana "territory" during January and February of 1937 would probably have been interesting. Nature lover and amateur naturalist that he was, it is more than likely that he would have noted the changed condition of the country and the resultant changes in the average flood stage of 1779 and 1937. Gone are most of the water-retaining and water-consuming forests; gone are the waving meadows of tall grasses; gone are the dams of the beavers and the erosion-resisting carpets of mosses and shrubs, and gone also are the deer and the bears and most of the other mammals, as well as a large majority of "all God's animals and birds."

We have, here in the Twentieth Century, suddenly become aware, on an increasingly popular scale, of the need for conserving our animals and birds if we expect them to accompany us down through the ages. The great flood sweeping over the Ohio and Mississippi Valleys brought about an inestimable loss of life to wild friends of man. There is hope, however, that the enormous losses suffered by property owners, as well as the wildlife along these great valleys, will refocus the attention of the country on the need for preventive measures against floods of the future, for the protection of residents along the banks as well as for the

COURTESY AMERICAN RED CROSS

AWAITING RESCUE
Dogs and chickens await the arrival of a rescue party to take them from their barn-top refuge

conservation of the soil, and the birds and animals that live upon it.

No accurate estimate of the deaths by starvation or drowning of animals or birds has been made. In fact, it is highly improbable that such an estimate could ever be made with any degree of accuracy. One may, however, gain some idea of what these losses must have been by picking up from flood workers' accounts of what happened to wild creatures of the forests, meadows and creek banks.

Take, for instance, the report of a single trip made by a game management agent of the U. S. Biological Survey along the Mississippi and its backwaters near Henderson, Kentucky. The agent said that he had passed over backwater country a few days after the water had begun to fall and saw the body of a rabbit hanging from a grapevine, with that of an opossum sticking out of the mud not twenty feet away.

"Quail suffered perhaps most of all birds," the agent reported. "In many instances I passed coveys perched in willow trees, or the tops of taller trees almost submerged. Water stretched for miles in all directions, making it obvious that, as the quail are very short-flighted, it would be impossible for them to reach higher ground without becoming exhausted and dropping into the water."

OPOSSUM JOINS THE REFUGEES

In fact this little fellow was so upset by the flood that he crawled into bed with a little girl in a refugee tent

His report was all the more impressive to the writer, because he had just spent two months traveling through the flood zones from the eastern and northernmost reaches of the Ohio down to the delta of the Mississippi at New Orleans. And it should be remembered that along some of the stretches of the Ohio the rampaging river was forty miles wide from bank to bank. Certainly this was no country for quail during this wet period, and countless coveys must have been swallowed by the angry brown waters as they boiled seaward.

We hear that old witticism so often, when the rains are pouring down, that "this should be fine weather for ducks." The average layman would likewise suppose, judging from the wide stretches of water for ducks to paddle around in, that flooded fields and swollen streams would make for holiday spirits among wild ducks and geese. On the contrary, however, these floods resulted in the scattering of thousands of mallards, pintails, scaups, and black ducks from their natural feeding grounds, for these ducks feed mostly in shallow waters where they can reach the bottom and glean water plants and other growths. Quite naturally when these plants were covered three to forty feet deep many waterfowl found the going difficult in their natural feeding grounds, and scattered to strange territory in search of food.

Fear is an instigator of strange actions—among men as well as animals. The floods brought about some unusual situations reported by various workers of the Red Cross and the Biological Survey. Down in Kentucky, while looking for marooned persons, rescue crews found two dogs and four rabbits were sharing the same barn loft. The dogs had in no way molested the rabbits. Many barns had a cat or two marooned in them, yet the roofs and lofts were also sanctuaries for many species of birds, including doves, quail, owls, sparrows, and swallows.

Near McDonald, Kentucky, rescue workers found four foxes—three red and one gray — marooned on a small mound. At the time they were first discovered the boats were loaded with people, and a second trip was made to bring the foxes to higher ground. When they returned they found that the reds had whipped the gray off the mound, and it was found, exhausted and nearly dead, clinging to the top of a tree sticking out of the water two hundred yards away.

In one of the Red Cross tent colonies at Harrisonburg, Louisiana, a family blew out the tent lantern and went to bed. Early the next morning a little girl felt something moving about her feet on her folding camp cot, and found that an opossum had snuggled in to escape the cold. Far from registering fear, the child remained quiet and called her father, who captured the frightened animal and cared for it until the water receded.

On President's Island in the Mississippi at Memphis, Tennessee, workers found an opossum floating downstream on a log. It was taken back to Memphis and liberated in one of the city parks. And it was to Red Cross headquarters in Memphis, when the Mississippi was at its highest stage along that stretch of its channel, that a call came for boats to evacuate marooned deer from several islands

south of the city. Sixty-seven deer were eventually removed from flooded islands and taken to higher ground in that region, while farther south in Louisiana many were found crowding on the levees with the cattle and hogs.

On levees, ridges, ancient Indian mounds, and every slight rise in the terrain, wet, miserable men and women huddled with their domestic animals and a few belongings, waiting to be evacuated. Crawling upon the levees with them came the foxes, rabbits, deer, skunks, field mice, chipmunks, and all other animals of the fields and the woods. Only the snakes were denied refuge. Small animals fled them, men killed them. Probably it was so in the first flood.

On the Louisiana banks of the river opposite Natchez, Mississippi, a farmer heard his mules making an unusual disturbance in the barn, which was only about twenty yards from the edge of the water. Investigating, he found that two small black bears had crowded into an empty stall and were making themselves perfectly at home, much to the discomfort and peace of mind of the mules. The stall was one that could be fastened securely, and the door was slammed shut until the farmer could summon help. The bears were eventually caught and placed in improvised cages until the backwater left the swamps.

Animals noticed by rescue workers were, for the most part, those accustomed to remain active in the open throughout the year. But what of the small animals that hibernate or are more or less inactive—jumping mice asleep in their underground burrows; the meadow mice in their nests of grass on the ground; the tiny shrews that keep amazingly alive throughout the winter looking for insects even under the snow? It is highly probable that most of these animals in the flood sections have perished, for Nature, foresighted as she is in most instances, failed to give the animals (and mankind too) the instinct to "smell" a flood and flee before its destructiveness.

COURTESY AMERICAN RED CROSS

SITTING THE FLOOD OUT

This cat was one of many that patiently awaited rescue or lost all nine lives in the floods

The woodchucks, the chipmunks, a large number of the black bears, the ground-hogs, even the water-loving muskrats must have perished in great numbers. They had no warning before the muddy water came pouring down into their snug underground homes, and they would, in the majority of cases, have found a wide expanse of water to cross between them and safety.

Disaster that comes with high water is no new story to man, nor is it new to animals. But each year, because of the denuded banks and slaughtered forests along the streams and throughout the drainage basin, the swift flow-off of water is becoming less and less impeded, the danger greater and greater. And while the needs of human beings naturally come first in all plans for flood control and soil conservation, it must be remembered that an abundant wild life is a considerable contribution to human well-being and happiness, and the betterment of wildlife conditions will make for the betterment of humanity.

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## TEACHING CONSERVATION

Some time ago we announced a plan to publish a special American Nature Association bulletin designed to assist the teaching of conservation as a school subject. There have been inevitable delays in connection with this but the bulletin is now available to members of the American Nature Association for a three-cent stamp to cover mailing, and to others at twenty-five cents a copy. It may be obtained from the American Nature Association, 1214 16th Street, Washington, D. C. The title is "Teaching Conservation", and it is Conservation Bulletin Number 3. This 32-page bulletin is not designed to present a course of study but to be generally suggestive of methods and of inspiration to teachers.



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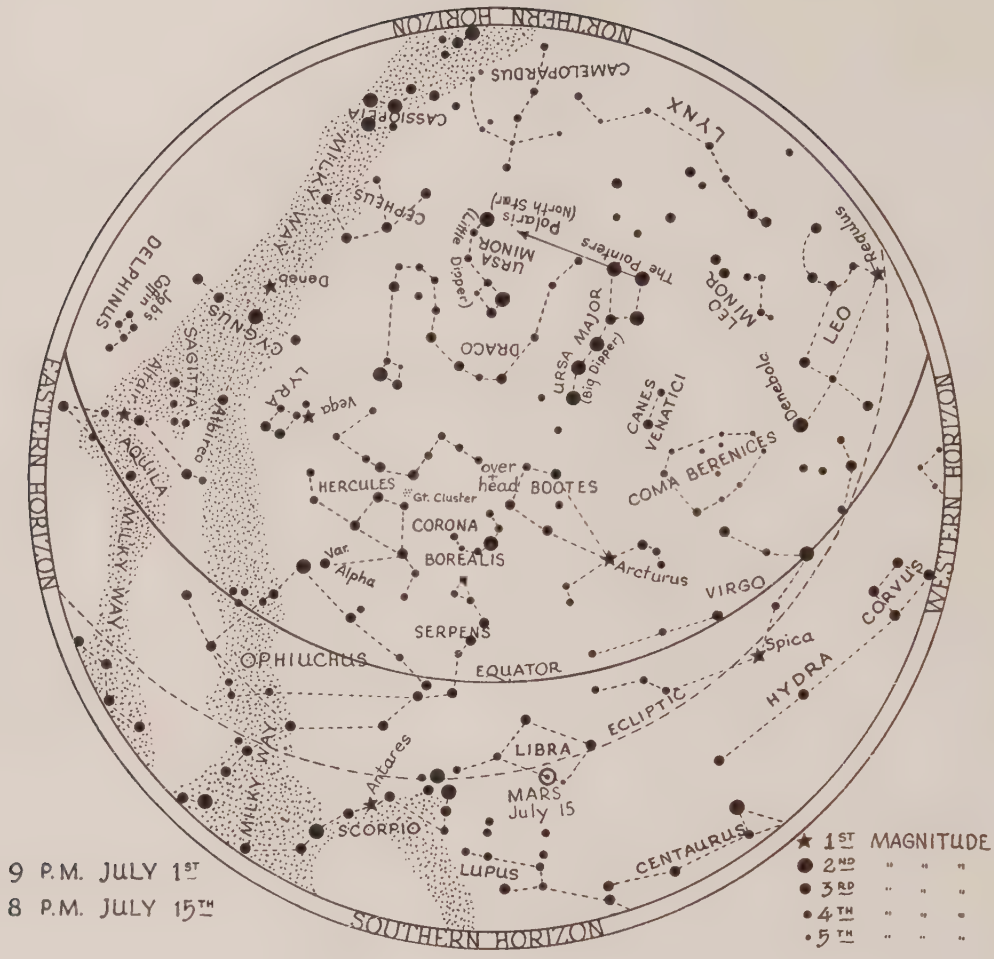



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south.

# SCORPIO

## Most Brilliant of the Summer Constellations

*By* ISABEL M. LEWIS

ACCORDING to a legend of the stars, Scorpio, The Scorpion, vanquished the mighty warrior Orion with his sting and as a reward was exalted to a place in the heavens. There one may still see Orion disappear below the western horizon before the scorpion comes into view in the southeast, as the two never are seen above the horizon at the same time.

Many centuries before the Christian era, Scorpio also included the constellation now known as Libra, The Scales, next to it on the west, the only constellation of the zodiac not named for a living creature. The stars now in Libra represented the claws of Scorpio, and an old name for the huge double sign, then one of only six zodiacal constellations, was Scorpius Cum Chelis, "The Scorpion with his Claws". But in the course of the centuries, exactly when is uncertain, the Scorpion drew in his claws to make room for the new constellation of Libra. Even though it was reduced considerably in size, Scorpio remains one of the most brilliant constellations in the heavens and the finest in view on summer evenings.

Much of the splendor of Scorpio arises from the fact that it lies in a brilliant portion of the Milky Way, a region in which there have been a number of outbursts of novas or temporary stars. Five of these novas, all of first magnitude or brighter, were recorded before the year 1572 in this one constellation, and here also lies that dark "coalsack" in the Milky Way that caused Sir William Herschel to exclaim when he first saw it in the

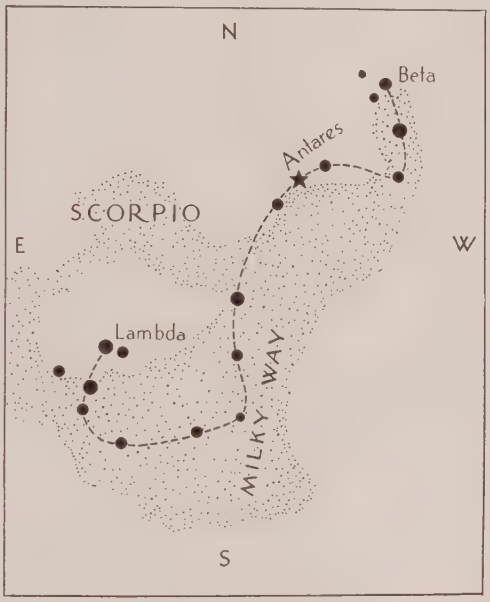
field of his telescope "Hier ist wahrhaftig ein Loch im Himmel"!

In Scorpio, 184 stars have been catalogued that can be seen without the aid of a telescope, and of this number one is of first magnitude, four of the second, and nine of the third, arranged in a long, curved line that well represents the tail of the Scorpion.

Most striking in appearance of all the stars in Scorpio is its first magnitude star Antares, "Rival of Mars", flanked on either side by a third magnitude star. The three stars in line, evenly spaced, form a characteristic grouping which, with the long curved tail of brilliant stars, outline a configuration that makes this constellation one of the easiest to identify.

Fiery Antares is one of the most remarkable stars in the heavens. A super-giant red star with a diameter estimated at 400,000,000 miles, it is surpassed in size by no other known star. This value of the diameter depends upon the measured parallax of the star, which gives its distance.

It is necessary to know the parallax before the measured angular diameter can be converted into miles. If there is an error in the value of the parallax, it will change the value found for the star's diameter in miles, but it is believed that the distance of 163 light years found for Antares is a reliable estimate of the distance of this super-giant sun beside which our own sun would be a mere pygmy. If the sun and Antares were viewed from the earth at the same standard distance of 33 light years, which is used in the comparison of the "absolute magnitudes" of the stars, then our sun would appear as bright as a fifth magnitude star, just comfortably visible to the eye without the aid of a telescope, while Antares would appear as brilliant as the planet Jupiter at its brightest! Antares has a small, green, companion star of the seventh magnitude but it is so close to the brighter star that it is impossible to see it in the glare of its light even with a small telescope.




THE SUMMER'S FINEST

Brilliant Antares and the star-studded Milky Way combine to make The Scorpion the most beautiful summer constellation

Next to Antares in brightness is the star Lambda Scorpii at the tip of the tail of the Scorpion. It is a star of one and one half magnitude and is known also as Shaula, Arabic for The Sting. Close to Lambda on the west, the two forming a brilliant pair, is the third magnitude star known as Upsilon Scorpii. A line drawn from this star through Shaula for a short distance points to two fine star clusters, both of which can be seen in the field of an opera glass at the same time.

Antares, supposed to be the heart of the Scorpion, is protected by the double star Sigma on the north, and Tau on the south. The bright star of third magnitude farthest north in the constellation is Beta Scorpii and in the telescope it appears as a fine double star with a third, faint star close to the brighter of the two stars, the three stars forming a triple star-system. Halfway between Beta and Antares is a star cluster on the edge of the dark region in the Milky Way which Herschel referred to as a "hole in heaven" but which is without doubt one of the dark nebulae which exist in great numbers in the Milky Way.

Although Scorpio is considered to be the finest and most brilliant of the zodiacal constellations, only a small part of the constellation lies in the path of the sun, which is in Scorpio only nine days of the year. Old Sol spends much more time in the constellation of Ophiuchus which is not even one of the zodiacal groups. In the northern hemisphere, Scorpio is always seen low in the southern sky. Part of the time some of the brightest stars in the long tail are below the horizon and it is seen at its best when it is on the meridian due south. Even though the conditions under which this constellation appears in northern latitudes are unfavorable, it is the most beautiful and brilliant constellation in view on summer nights. It is within the tropics and in the southern hemisphere that Scorpio is seen at its best, for there it rides high in the heavens, its long tail ablaze with brilliant stars lying directly in the path of the Milky Way where the two branches in the northern sky meet again to form one stream.

The planet Jupiter is in fine position for observation this month in the evening sky. It comes into opposition with the sun on July 15 when it is above the horizon all night. Its distance from the earth at that time is about 384,600,000 miles. It is now in the constellation of Sagittarius, following Scorpio on the east, a few degrees to the northwest of the little inverted milk dipper that is the characteristic configuration in Sagittarius. Jupiter is the giant of our solar system, greater in size than all the rest of the planets combined, and his satellites and belts and everchanging surface markings are always a source of interest when seen through the telescope.

Mars is still a magnificent object in the evening sky in Libra, fiery red in color and now far surpassing in splendor red Antares in Scorpio, not far away to the southeast.

Saturn is now in Pisces and rises shortly before midnight. It is as bright as a star of the first magnitude.

Venus is still a morning star, a magnificent object rising about three hours before the sun, and passing from Taurus into Gemini during the month.

Mercury will be in superior conjunction with the sun on July 8 and will be too close to the sun during the month to be seen.

# Nature Magazine in School

*A Department of Aid to the Teacher*

**In order that teachers and parents may further use Nature Magazine as an aid to the study of Nature and Science, this page is devoted to the following brief notes based upon articles in this issue and suggesting ways in which they may be used as a source of inspiration and information. To bring these Nature study thoughts to our readers we have obtained the services of one eminently qualified for the task, and this department is edited**

BY ESTHER SCOTT

Instructor in charge of Elementary Science
Washington, D. C., Schools

### Birds and Ricefields

The summer home of the "Rice bird" is found in the grasslands and meadows that reach from Canada to West Virginia in the Alleghanies and to Utah in the Rockies. Early in July, the remarkable song may still be heard, beginning in beats of three and continuing with ever increasing tempo to a grand finale. In summer plumage, the bobolink is so distinctly marked that children easily can make colored sketches of it. A collection of such pictures would make a worth-while notebook. Parents can encourage the notebook habit by showing pictures of birds that may be seen on a field trip, and in cases where children cannot draw their own outlines of birds, these may be provided for them to color. Another excellent way to interest children in bird life observation is to read to them or let them read about someone who has enjoyed this pastime. The pages written by the author of this article are full of magnetism that encourages one to go outdoors for himself.

### A Striped Dweller of the Fields

At this season of the year, it is desirable to make up a list of Nature activities in which pupils can engage when school is over for the summer. During the past several summers, pupils in the Washington Public Schools have kept in touch with this program through a series of radio broadcasts in which the pupils themselves have participated. The topics developed included bird calls, forestry notebooks, insects, care of pets, sailboats and kites, and might easily take in spiders. This article would be an excellent source of information for a talk on spiders. Pupils could be encouraged to bring the garden spider into their own gardens where observation would be more convenient. Some pupils would like to keep a record of their observations in a notebook, and an exhibition of these in the fall would help greatly to encourage activities for the next summer.

### Congo Okapi

Many young persons are first interested in science by the thrill of adventure and the joy of conquest. Later, some are led into the high realm where truth alone reigns and where exactness and patience are the keys to success. Parents whose children have a scientific leaning should encourage this type of reading. In Congo Okapi, one feels the dangers lurking in the jungle and the joy of photographing the strange animal. Some young persons would be stimulated by this article to find out more about the okapi. Why is it called a living fossil? What relation is it to the giraffe? Why are its legs striped like those of a zebra if it is not definitely related to the zebra? Are its feet cleft or in one piece? Is it, therefore, more closely allied to a horse or a cow? Teachers will want to keep this article as a valuable reference for social science units dealing with Africa.

### Thy Doublet of Changeable Taffeta

When this issue of NATURE MAGAZINE reaches the homes of its readers, the circus will be coming to town. During its sojourn many chameleons will be sold on the circus grounds, and some of these will find their way to school. This article, therefore, will be useful in looking up the questions that are sure to be asked by the pupils. A study of the chameleon might well begin with a list of these questions. This animal has managed to survive in considerable numbers in a region long inhabited by man. Its adaptations are worthy of note. In the animal world, camouflage has been proven to be quite effective. The "universal eye" is another remarkable adaptation. Most of the pupils will want to handle the chameleon and feed him, and at this time these adaptations easily may be observed. Geography work could be carried on at the same time by studying the native land of the chameleon.

### An Orchid Giant

This article tells how a real conservationist conducts himself in the forest. In preparation for a trip to the woods, pupils might be asked to write a description of some flower which they had found on previous trips and to tell whether or not they had picked it. A comparison of these descriptions with this article should bring out the care this author exercised in breaking only one small flower for study, leaving the rest to make seeds. A code of etiquette that should be followed in the woods also could be drawn up. After taking the trip, the teacher and class could rate the class on their behavior, using the standard set by the group.

### More Than Just a Volcano

The subject of volcanoes is one of great interest to pupils of the elementary and junior high schools. They want to know what makes it erupt, why some volcanoes erupt only at intervals and if a volcano could occur near their school. Some of these questions may be answered by experimenting with a working model of a volcano. There are several types of these. One is made by covering a cone of stiff paper or an old lamp chimney with modeling clay. A funnel containing clay mixed with water in about the consistency of mush is placed in the top. Inside the volcano, the end of the funnel is attached to a rubber hose that is connected to a source of steam pressure such as a can filled with water heated over a hot plate. The volcano might be modeled on the lines of Lassen Peak described in this article. Another satisfactory volcano may be made by forcing the end of a syringe filled with heated paraffin or wax of different colors through a piece of cardboard.

### Twice-Blooming Irises

The iris always has been a favorite in the gardens of children. Now that the twice-blooming variety has been introduced, these flowers should be even more popular. Vacation time, when both parents and children have more leisure, happens to be the right season to set out iris roots. Iris can withstand an amazing amount of exposure to both wind and sun. Due to its great hardiness, it is almost sure to succeed even in the uncertain hands of the most youthful gardener, and is therefore an excellent flower for a beginning gardener's experiments. Children derive pleasure from a garden in proportion to the extent of their activity in it, so let them do as much of the work as they can. In planning their gardens, they enjoy looking at catalogues, cutting out the pictures of their favorite flowers and mounting them so that they stand up like paper dolls. The paper plants can be moved about on a sheet of paper cut to represent the garden itself. In this way some appreciation of color combinations may be obtained before the real garden is planted.

### Our Own Ice Age

This article goes hand in hand with the "Birds of the Midnight Sun", as one of the theories regarding the cause of migration attributes this phenomenon to the ice age.

In addition, it presents background information for the understanding of soil conditions in the northern part of this country and parts of Europe. A large relief map of North America could be made. On it, areas representing the rich soil made by forests during thousands of years could be located. Then, using the map of the glaciers as a guide, this soil could be pushed south into what is now the United States. The glaciers remaining at the present time might be represented by pouring paraffin into clay valleys. Clay models can be made showing the difference between the V-shaped valleys eroded by streams and the U-shaped valleys formed by glaciers. In some sections of the country, stones showing the scratches left by glaciers may be collected as further evidence of the work of this great ice sheet.

In reading this article, pupils can not help being impressed with the great age of the earth and its constantly changing aspect. "The hills are shadows, and they flow from form to form and nothing stands."

EAGLES MERE, PA.

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## PHOTOGRAPHIC NOTES

(Continued from page 3)

The Photographic Department of NATURE MAGAZINE is devoted to its readers interested in photography and maintains a service that renders assistance with any photographic problems. You are invited to take advantage of this service. Address all photographic inquiries to Samuel Brown, NATURE MAGAZINE, 1214 Sixteenth St., N. W., Washington, D. C.

Cordially,
SAMUEL BROWN

## Meet Our Authors

**Archibald Rutledge** is recognized as one of the leading Nature writers in the United States, and is well-known for his ability to put into inspiring language his interesting Nature experiences.

**Milo R. Clare** studies the life of spiders as a hobby, and the photographs reproduced with his article in this issue are only a small part of a large collection he has accumulated over a period of years.

**Attilio Gatti** has been to the Congo country so many times as an explorer and collector that he could almost be called a commuter. For more information about him, we refer you to page fifteen of this issue.

Such a charming style of writing could be expected from **Lawrence R. Holmes**, a student of English at present connected with the English Department of Maryland State University.

**S. Judson Ewer**, Ph.D., is a trained botanist now devoting his time to a study of plants both in the wild and from the standpoint of the gardener. One of Mr. Ewer's major contributions to NATURE MAGAZINE was *Ferns, Their Life Story,* that appeared last September.

Particularly qualified to write about the fauna and flora of Lassen Park is **Ruby Johnson Swartzlow**, wife of Lassen Park naturalist Carl Swartzlow.

**Thurlow Weed**, with his brother Howard, operates the National Iris Gardens at Beaverton, Oregon.

The late **Charles Fitzhugh Talman**, long connected with the United States Weather Bureau at Washington, wrote widely in various scientific and popular periodicals, including Nature Magazine. *Our Own Ice Age,* we regret to say, is the last of his articles on physical phenomena that we have for publication.

**Raymond S. Spears**, now president of the American Trappers Association, has had a long and varied experience as a student and writer on wildlife. He knows why it is disappearing.

**William M. Rush** spent much of his time in the Yellowstone Park area studying wildlife when he was connected with the Forest Service, and his article gives us his views on wildlife values as he has found them. At present he is Director of Wildlife Management for the Biological Survey in the states of California, Nevada, Oregon and Washington.

**John W. Maloney**, formerly a Far East and European newspaper correspondent, now is public-relations officer of the American Red Cross. He was assigned to the flood zone when the last disaster swept down the Ohio Valley.

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# NATURE IN PRINT

**As a convenience to readers the books reviewed in this department of Nature Magazine may be ordered through the book department of the American Nature Association.**

### For Young Nature Lovers

An attractive little Nature book with the interesting title *Hop, Skip and Fly* has just come to hand from Holiday House. It is the work of Irmengarde Eberle. Illustrations are done by Else Bostelmann and they are charming and in the spirit of the text. Miss Eberle's story is of the little creatures with interesting life habits—the frog, scorpion, small brown bat, stickleback, mud dauber wasp, garter snake, ant and lizard. While we are not particularly keen about dialogue in the mouths of Nature forms, Miss Eberle uses it with restraint and makes it credible and a means both to imparting information and making her story progress. She explains her reason for resorting to this practice and it's a logical one because she makes the animals talk only about things within their own experience. This attractive little volume sells for two dollars.

### Who's Who in the Zoo

Like a sight-seeing trip with an expert guide is *Who's Who in the Zoo,* prepared by workers of the WPA Federal Writers' Project in the City of New York. The volume, textually and photographically excellent, has been checked for accuracy by curators of the various zoological institutions of New York and edited by a competent staff headed by Ralph De Sola. Halcyon House, 386 Fourth Avenue, New York, are the publishers.

### Sea Shells from "Down Under"

*Victorian Sea Shells* by C. J. Gabriel is the second of a series of handbooks designed by the Field Naturalists' Club of Victoria to stimulate interest in the state's flora and fauna. The author is one of Australia's foremost conchologists and possesses one of the largest collections of shells in the Commonwealth. The 68-page handbook contains data on hundreds of species found in Australia's waters, and can be obtained from Robertson and Mullens Ltd., 107 Elizabeth Street, Melbourne, for one shilling, six pence.

### Termites

Bulletin 83 of the New England Museum of Nature History is distinguished by a discussion of termites by Charles H. Blake. He discusses the life habits and depredations of these important economic insects.

### Elephant Boy

The story of *Sabu, the Elephant Boy* is related in an interesting book written by Frances Flaherty, wife of Robert Flaherty who directed the current Alexander Korda film of the same name. Although this is a book for children, the hero's interesting career as a film star will win him a host of adult admirers. The book contains many remarkable photographs taken by the author while her husband was on location in Mysore, India. The book, published by the Oxford University Press, New York, is priced at $1.00.

### Termite City

The study of termites in the laboratory and in the jungles of South America has been the life work of Dr. Alfred E. Emerson, professor of Zoology, University of Chicago. In *Termite City* Doctor Emerson and Eleanor Fish tell the life story of these interesting insects—a story scientifically accurate and thoroughly understandable. The book is an excellent one for imaginative boys and girls, and to anyone who is interested in the world and the creatures in it. Published by Rand McNally and Company, Chicago, the book is priced at $1.50.

### Igloo Stories

Such stories as the Eskimo mother would tell her youngsters by the sputtering light of an oil lamp are contained in *Igloo Stories,* by Clarence Hawkes, a book that portrays six of the most important animals of the Arctic: the seal, walrus, musk-ox, polar bear, blue fox and wolf. Unfortunately, the widely differing lives of the hair seal and the fur seal are confused in the account.

Mr. Hawkes, a graduate of The Perkins' Institute for the Blind, where he was a friend and contemporary of Helen Keller, has published forty-four volumes and innumerable poems in the language of five countries. *Igloo Stories* is published by The Christopher Publishing House, Boston, and is priced at $1.50.

### Gardener's Companion

Miles Hatfield, of London, England, has compiled a wealth of gardening material between two covers and given it the collective title of *The Gardener's Companion.* The 640-page book, by the author's admission a book for the unconventional, curious and yet intelligent gardener, contains, beside the extensive *Gardener's Anthology,* chapters bearing such interesting titles as "The Garden, Past and Present," "Gardening for Epicures," "The Gardener's Botany," "The Gardener's Week-End Calendar," wherein is found the information on "what to do" throughout each week of the year, "Bird Tables and Nesting Boxes," and "Plants and Periods." Making the book complete are a short dictionary of specific names, a glossary and a gardeners' bibliography. The anthology is completely written for the British gardener, but it contains so much of interest that this fact is no bar to its general appeal in America. Published in London by J. M. Dent & Sons, Ltd., it is available in this country from E. P. Dutton and Company, Inc., New York City, at two dollars.

### Annuals for Your Garden

*Annuals You Should Grow* is an excellent booklet containing information on fifty species, by Julius King. Illustrations are in color by Evan Thurber, and accompanying each plant description is a growing chart giving the best times for planting, soil needed and all pertinent information necessary to a successful adventure in annual planting. In the back of the booklet are numerous check lists listing annuals that are best grown for background, ground covering, rock gardens, fragrance, or as climbers. Nominally priced, the booklet is available from the Whitman Publishing Company, Racine, Wisconsin.

### Free Gardening

*Gardening on Nothing a Year* tells the interesting story of Mary S. Griffith, the author, who cut the corners, beat the depression, robbed Peter to pay Paul and kept her garden on nothing a year. At first we were a bit skeptical, when we noticed the title of her book, but a perusal quickly showed us how a beautiful garden can be grown with practically no outlay. The photographs of Miss Griffith's garden are proof that it can be done, even if we were not convinced by her charming literary style. Hale, Cushman and Flint, Boston, are the publishers, and the book is available for $1.75.

### Recreation Circulars

New York outdoor lovers will be interested in a series of recreation circulars published by the New York State Conservation Department, Albany, N. Y., containing trail and camping information for the region covered by each pamphlet. Well illustrated, the circulars may be had upon request and are entitled *Public Use of the Forest Preserve, Adirondack Camp Sites, Catskill Camp Sites, Lake George, Adirondack Canoe Routes, The Trails to Marcy, Catskill Trails* and *Lake Placid Trails.* A recreation map of the Adirondacks and the St. Lawrence reservation, showing streams, lakes, mountains, postoffices, railroads, highways and trails, is available for fifteen cents.

### Nature Poems

A tiny volume containing a wealth of poetry about Nature in its many forms is *Nature Poems,* by W. H. Davies, available for 75 cents from Bruce Humphries, Inc., publishers, Boston, Massachusetts.

### Cornell Leaflet

Another Cornell Rural School Leaflet, simply entitled *The Sea,* has made its appearance. The pamphlet matches Cornell University's other leaflets in excellence of presentation and illustrations, and concerns itself principally with the small animals including the oysters, shrimps, mussels, starfishes, crabs, and others that live in our coastal waters. This leaflet was prepared and supervised by E. Laurence Palmer, professor of rural education at Cornell and is available from the New York State College of Agriculture at Ithaca, N. Y.

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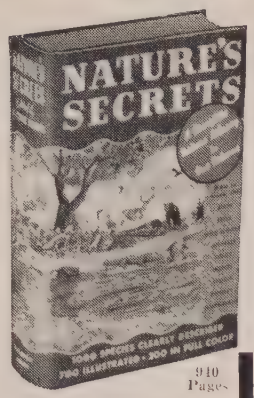


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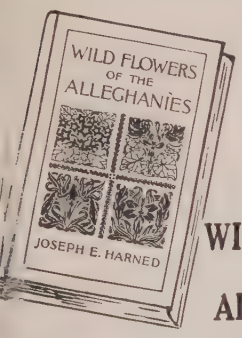


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## TWICE-BLOOMING IRISES

(Continued from page 30)

frosts, bloom stalks often flower perfectly in the northern sections.

Where can these unusual new strains be procured? This is the question that comes naturally into the minds of every interested individual. Most of the varieties mentioned in this article may be obtained from any one of the dozen leading iris hybridizers and specialists scattered across the continent. Varieties of this type are so new that they are not to be found growing in most local nurseries.

Although the iris ranks next to the rose in popularity as a garden flower throughout the nation, it is to be regretted that many persons continue to associate the modern iris with the old inferior "flag." It is true that the beautiful creations of today were developed through selective breeding from the various species of wild "flags" native to southern Europe, but the present plants no more resemble the iris to be seen in gardens when the World War ended than do our present-day motor cars resemble the horseless carriages of that same period.

Should you desire to see a really modern iris flower, and there is no large specialist's garden convenient to visit during the blooming season, plant this summer or fall one or more of the following moderately priced varieties: Frieda Mohr, Indian Chief, Dauntless, President Pilkington, Alta California, Al-lu-we, Eloise Lapham, Buechley's Giant, Rameses, Los Angeles, San Francisco, Chromylla, Meldoric, Red Dominion, and William Mohr. Particularly outstanding varieties that retail at a higher figure are Mary Geddes, Easter Morn, Venus de Milo, Imperial Blush, Sierra Blue, Crown Prince, Wonderchild, Jean Cayeux, California Gold, Lady Paramount, and Joycette.

If you have a flower garden in which no modern varieties of iris have found a place, by all means add a few. If you have a garden containing iris but none of the new twice-blooming sort, you will not regret experimenting with them.

## Sonnets and Sestinas

*Sonnets and Sestinas,* by Wilmon Brewster, is unique in that it is a blend of both poetry and scholarship, something never before attempted, and therefore will be of interest both to the poetry lover and the student of literature. The sonnets and sestinas touch upon a variety of subjects, many of them concerning forms in Nature. Included also are the histories of these two types of poetry, and both are presented in a clear and interesting manner. The volume is published by the Cornhill Publishing Company, Boston, Massachusetts, and is priced at $1.50.

## Wildlife Cover for Indiana

Establishment of a fifteen-acre nursery in the Wabash county state forest for the production of trees and shrubs providing food and shelter for wildlife has been announced by the Indiana Department of Conservation. Persimmon, osage orange, red and black haw, viburnum and other plants bearing fruit attractive to wildlife or providing shelter will be grown for transplanting purposes. The nursery is the fourth to be developed in the State by the Division of Forestry.


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HOWARD J. SHANNON
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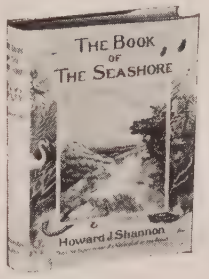
DR. ROY WALDO MINER
*Curator of Marine Zoology, American Museum of Natural History*

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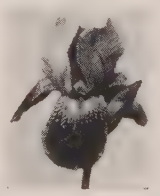

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## THE CHILD AND HIS GARDEN

(Continued from page 48)

It may be, however, that your young son or daughter will scorn a flower garden and want a vegetable garden instead. Such is likely to be the case if Daddy has a vegetable garden too. Beets, carrots, white and green string beans, small red cherry tomatoes, tiny yellow pear tomatoes, and radishes are to be recommended, since all of these are easily raised and bear steadily over a long period. Being small themselves, children like small things whose appropriateness in size they seem to realize—hence their preference for the tiny yellow or red tomatoes. Odd shapes, of course, will arouse interest. Thus gourds, squashes and cucumbers are favorites, and the gourds make dandy toys when they are dried.

But perhaps young Jean and Tommy will scorn both the flower garden and the vegetable garden, and will want to mix flowers and vegetables indiscriminately in the same plot. Let them do so. Why shouldn't they have tomatoes growing among the marigolds if they want them? Five and six can see nothing reasonable about the foolish adult idea of growing flowers and vegetables separately.

And don't be horrified either if Tommy insists on a border of clam shells such as he saw at the sea shore. He probably likes their clean whiteness and considers them beautiful. After all, good taste is not developed overnight. Having no sense of proportion, he may also want a path through the middle of his three-foot plot. Let him have it, that he may stand in its center and with feet placed wide apart proudly proclaim ownership of his garden.

Nature is likely to justify his pride. Perhaps because children are still close to Nature, Nature is usually kind to a child's garden. She allows them to mix corn and wax flowers, tomatoes and roses, to plant too deeply and to pull out half of what they plant, and still permits their gardens to grow into places of naive charm.

By the age of twelve a child is old enough to actually plan a garden and to assume full responsibility for it. With paper and pencil at hand encourage him to study the seed catalogues early in January. Increase the size of the plot allotted to him to about ten or twelve square feet—no larger lest the work of caring for his garden become a drudgery instead of a joy. Help him with advice when wanted but don't do his weeding for him when he neglects it.

At this age your young son or daughter may scorn all your suggestions and want to raise some exotic things such as medicinal herbs because he has been reading of medieval witch doctors, or tobacco because he has been studying the products of the South. However unorthodox his desire, let him attempt its gratification, remembering always that this is his garden, not yours.

There are just two other rules that we parents of these young gardeners must never forget. Tragic as it may seem a child must be allowed to abandon his garden when he wants to. He is still living in an age of discovery. There are so many things to intrigue his interest in this strange new world! Quite naturally the garden is deserted when a new bike arrives. And if he is not scolded for this desertion he will probably return to it when the novelty of the bike has worn off.

He must also be allowed to dispose of the produce of his garden after the dictates of his own heart. Make it a rule never to pick Margie's flowers and you will be the recipient of many a mixed bouquet, proudly presented by a grubby little hand. At dinner, serve Robert the tomatoes he has raised and you will be invited to taste them too.

With gardens of their own, children soon learn not to trample on plants and not to pick unopened buds. They become the protectors of Nature instead of her ravagers. And above all they gain a sense of the immutable as they see the unchanging laws of Nature demonstrated over and over again in the life cycle of plants and flowers.

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### Try It

Mr. H. Alban Anderson of Peekskill, N. Y., wonders if readers of NATURE MAGAZINE get "all the beauty possible out of the reproduced pictures. The camera," he writes, "is a one-eyed instrument. Consequently its reproductions are more or less flat, being practically two-dimensional. Try looking at them with one eye closed, if you haven't done so before. Even the pictures of the emergence of the seventeen-year cicada are seen to better advantage."

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### Youth Service Organization

A directory with the above title has been prepared by M. M. Chambers as a preliminary report to the American Youth Commission of the American Council on Education, and is a survey of 330 national associations whose programs are concerned wholly or partly with the welfare of youth. The address, membership, purpose, activities, publications, staff and finances of each group are given, and an introduction summarizes high points on the role of national associations and their varied local enterprises. Twenty-six tables and fourteen charts exhibit various characteristics and interrelationships of the many organizations and give coherence to the wide panorama of national non-governmental youth-service. The directory is available from the American Council on Education at Washington, D. C.

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### Want to Write Him?

F. J. McNamara is a lighthouse keeper on Rottnest Island, Western Australia, and reports that he is a keen amateur naturalist in a "naturalist's paradise." Furthermore, he would like to correspond with other enthusiasts to exchange information, snapshots and anything else that might come to mind. His address is care of Post Office, Rottnest Island, Western Australia.

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### Nature Guide School

William G. (Cap'n Bill) Vinal is director of the Nature Guide School at Mt. Toby Demonstration Forest holding session from July 6 to August 14. The course is under the auspices of Massachusetts State College and details may be obtained from the Short Course Office of the College at Amherst, Massachusetts.

### More Robin Hitch-Hikers

Robins like railroading, apparently. From the Duluth, Minnesota, office of the Duluth, Missabe & Northern Railway Company came the news that a mother robin, like the robin rod-rider whose story appeared in our May issue, built her nest on the airbrake compartment under one of the company's cars. Undiscouraged after being shooed away three times, she built her fourth nest and laid her eggs. Mother robin refused to ride with the eggs when the car took its daily run between Alborn and Coleraine, but she would hop back on the nest on the car's return each evening. Realizing that something should be done to insure safe passage of the unhatched eggs, the train crew supplied a kitchen strainer to put over the nest. After riding exactly 3240 miles without incident or accident, the two young ones, which had hatched on one of the trips, decided enough railroading was enough and flew away.

The incident has been publicized in the October, 1936, issue of U. S. Steel News, 71 Broadway, New York City.

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### Bird Quarterlies

Almost in the same mail two interesting quarterlies of ornithological groups come to hand, one *The Flicker* from the Minnesota Bird Club of the University of Minnesota, the other *The Migrant* from the Tennessee Ornithological Union. The former is making its bow as a printed publication and is edited by George N. Rysgaard. Ralph Woolsey, president of the club, contributes an excellent analysis of the miniature camera for bird photography. An outstanding feature of *The Migrant* are the observations on the raven by Bruce P. Tyler.

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### Arctic Fox Biography

From the prolific pen of Ernest Thompson Seton has come another story, this one about Katug, the Arctic Fox. The book portrays all the humor and pathos of the life of the "snowdog," including the conquest of his greatest enemy, hunger. *The Biography of an Arctic Fox*, published by the D. Appleton Century Company, New York, is available for $2.00.

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### Prizes for Snakes

The San Diego, California, Zoological Society has offered prizes for snakes. Awards will be made to those bringing in alive and unhurt the three largest collections of snakes, and the largest collection of lizards, found in San Diego County. A record of where each reptile was found must be supplied. The contest is open until October 1.

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### More Trees—Less Erosion

To halt erosion in gullies and steep hillsides, the Soil Conservation Service plans to plant about 175,000,000 trees this year, Chief of the Service H. H. Bennett reports. The 1937 plantings will bring the total figure to around 600,000,000 trees in a little more than four years.

# Diana Thorne's DOG COLUMN

THE merry, up-standing, tough, wiry Airedale, in his carriage and his quizzical expression, seems the answer to the immense amount that has been written about him; some of it ridiculous (and by writers who should have known etter) but most of it in sheer praise of him, none of it unjustified.

The largest of the terrier family (comprising ten or more kin), he has l the toughness, spryness, shrewdness and good temper associated with the wellers in the land of his apparent origin, Yorkshire, and from which he derives is name. One writer naively remarks that the breed was "manufactured" there! hat is a quaint term for evolution. The average good specimen of today would ave much to amuse him if he could read.

Yorkshire, anyhow, was (and is) a dog-loving and sporting country, and it is more than probable that the first dog-show proper (a modest forerunner of the immense thing we see in Madison Square Garden each year) was organized there as an elaboration or development of the dog department of the county-town fair.

At that time (the middle of last century) the smooth fox terrier and the quaint little "Yorkshire" were favorites in public esteem generally, but, within a decade or so the Airedale was destined to supersede them in popularity.

He is an all-around sportsman both his general behavior and outlook, and in his usefulness in the covert and in c field.

When one adds to the qualities that make him a perfect dog for the outdoors e fact that he has perfect manners as a house dog, one leaves nothing that is sirable to find to add to the list of the points in his favor. Further, he is a dog grace and beauty.

For a seaman he is ideal. He is probably the strongest swimmer of all dogs, t even excepting the otter hound or the Newfoundland.

The permanent feud that (so far as my observation goes) seems peculiarly to ist between the Airedale and the German Shep- rd may not have its ground so much on a racial tipathy as on the moot question of "who best d his bit" in the last great War. At any rate, ere is an idea!

Undoubtedly the members of these two breeds d a large share in the war activities and came t of them (those who survived) with unques- ned honors. The selection of them above all hers certainly was not without due considera- n of special fitness for the tasks set them. In eed, endurance, loyalty, docility and intelli- nce the Airedale ranks as the equal of the Alsatian", and in good humor he can give him ints and win.

With his brothers under arms and fire he is the ro of many books, (Continued on page 60)


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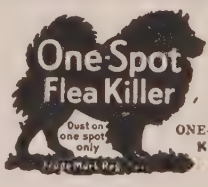


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## DIANA THORNE'S DOG COLUMN

(Continued from page 59)

notably that by Colonel Richardson.

In police work the Airedale is being trained and used successfully, more and more every day. To the game-keeper he is the ideal scout and helper. As a burglar alarm and house and property protector he has no superior. As a private policeman, in fact, his only shortcoming is that he cannot use a gun, and is at some disadvantage without one.

A perfect playfellow, trustworthy with children, a nurse-maid of the best, a house-guard beyond reproach, a peace-lover yet a staunch fighter, gentle yet of hardy physique, the Airedale is a canine *multum in parvo*. He is a dog for anybody's money—and a bargain.

Excessive praise for a dog? Not if you have ever owned an Airedale!

---

### A Dog's Life and his Diet

New facts on what and how to feed your dog are contained in an interesting booklet with the above title published by the Chappel Brothers, Inc., Rockford, Illinois. Illustrated, the booklet tells the values of proteins, fats, carbohydrates, minerals and vitamins in the dog's diet, and the laboratory tests that have been made to determine the proper proportion of each. The final pages of the booklet give helpful information on how to feed both puppies and grown dogs. This publication is available to readers of NATURE MAGAZINE free of charge.

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### Dog Breeding

The scientific researches that have been made with dogs to study reproduction and heredity have been compiled to make *How to Breed Dogs*, a new book by Leon F. Whitney, a man who probably has given more time and study to these problems than any other scientist. The big 352-page book, containing 175 illustrations, is a veritable encyclopedia written in the layman's language; it is a valuable addition to the dog breeder's or dog lover's library. The Orange Judd Publishing Company, New York, offers the book for $3.50.

---

### The Cocker Spaniel

Complete information on the history, development, characteristics, and standards for field and bench is contained in a new dog book with the above title by Ella B. Moffit, for many years a dog breeder and student. Systematically arranged both for the novice and the experienced breeder, the volume is the first we have seen that gives full treatment of this breed. Besides containing many illustrations of cocker champions, there is a complete list of bench show champions in the appendix. A complete chapter is devoted to Red Brucie, adjudged the greatest cocker sire in dogdom history. *The Cocker Spaniel* is published by the Orange Judd Publishing Company, New York, and is available from them for $2.00.

## STORY OF A SANCTUARY

(Continued from page 28)

One hot day in July, sixteen youngsters came pouring over the brush pile like water over a dam. In a minute or so, eleven of them lay prone on the ground, grotesquely twisted as if they had been sprayed by a machine gun. But they were only taking a sun bath, secure in the protection they seem to sense.

Rare and uncommon species have come to me—one hundred and three species have been identified in this one small haven—and forty species have been banded. To tell about all the wonderful sights I have seen in this backyard would fill a book. For a long while, I have been only a spectator standing on the sidelines, marveling at the miracle gratitude has wrought. The woods and old orchard have been here far longer than I can remember. So, also, have the birds they attracted. But until I founded this little refuge no one ever thought of using the happiness they inspired as a means of brightening other lives. And this has been accomplished without destroying a single tree.

Somehow I know I am privileged to see rare and beautiful things because it delights my heart to pass them along to others who need them. People who can see only the material value of every bird and tree and bush are reverting to a barbarism born of too much civilization. True, this is a practical world, giving too little thought to ideals. But an ideal that puts bird seed on window-sills, as well as sunshine in souls, spells a type of religion that even this callous world assimilates and likes. I have found that out.

And yet the axe threatens to end it all to make way for a "modern development". Drawing upon slender resources we have stayed the headsman's blade for a tiny while, tormented by knowing that so little is needed to stay it forever. Yet how well we realize that that which we loosely call progress has no concern with individual happiness, and least of all that of birds.

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## IN JULY—WILLIAM BREWSTER

(Continued from page 7)

clover fields nor ravaged bean patches to avenge and I would not have harmed it for worlds . . . When I drew off, it slowly swam ashore and stood there dripping, revealing more slender, graceful outlines than I had supposed any woodchuck could possess." Red-winged blackbirds fight off a marsh hawk, a kingbird outflies a robin, a short-billed marsh wren sings near its nest, and great-crested flycatchers, hummingbirds, swallows, and blue jays interest Brewster—and the rest of us, too—in their July ways. Brewster notes that mosquitoes will not follow his canoe under Flint's bridge, and he gets a visiting friend to identify eighteen large brown bats in his shed.

For smiles there is also the record of Brewster's friend in full dress for dinner, enthused, climbing a Douglas fir tree in pursuit of a black squirrel and presenting in his descent "a ludicrous sight, for his collar was reduced to pulp, his glossy shirt-front streaked with pitch, his drawers torn to shreds," Brewster having persuaded him to leave trousers and coat on the ground.

For sheer delight in poetic prose there is Brewster's description of the smoke from a July forest fire, "which had a rich, resinous, almost fruity aroma more pleasing to the nostrils than the choicest incense. It seemed the epitome of a century's growth, the fragrance of the hundred or more summers that have passed since these giant trees were young—gathered season after season, from the south wind, from the breath of the white azalea and clethra that grow in the neighbouring swamp, from the white water lilies that float on the river, from the myriad wild flowers that deck the adjacent fields and woods, and stored carefully away by provident Nature in the deep mat of fallen leaves, to be at length released by the subtle agency of fire and disseminated to the four quarters of the earth."

And, for the calendar, there is a superb sketch of the season, in miniature, Brewster's entry for July 19, 1909. "I have been much on the river these past few days," it begins. "Never have I known it more attractive, at least in summer. . . . The 'blue joint' (*Phalaris*) has attained its full height. . . . The wild rice, too, is fully grown. . . . It has fruited but the grain is not yet ripe, although the blackbirds seem to be attacking it. The expansion of the river in front of Ball's Hill is lined on both sides with a wide belt of pickerel weed in fullest flower. The rose or pink-purple blossoms stand erect in serried ranks, making a great show. Just outside these float the water lilies forming, in the foreground, a narrower band of snow white. . . . Along some of the stretches *Utricularia*, now in fullest flower, forms narrower belts of bright yellow.

"This, too, is the season when the bird life along this part of the river seems most abundant and interesting. There are swallows in swarms and red-wings by hundreds, skimming close over the water or rising with loud rustle of wings from the beds of wild rice and reeds. The red-wings are singing almost as freely and quite as joyously as in June. Never at any season have I heard so many swamp sparrows. . . . Song sparrows and Maryland yellow-throats were also singing delightfully but in less numbers. I see one or two bitterns and green herons flying about and dropping among the grass almost every time I look across from the cabins.

"At evening I hear the hoarse *quawk* of night herons or see them high in air over Ball's Hill. This afternoon a black duck passed me, flying down river, and this morning I saw a brown marsh hawk, apparently a young male. Kingbirds are unusually numerous along the river, perching on dead branches low over the water. A kingfisher flies back and forth past the cabins, rattling noisily. I see a muskrat or two at evening and one or two large snapping turtles daily. Bobolinks are not numerous but I hear their *clink, clink,* once or twice at morning and evening. On the evening of the 17th a marsh wren was singing just below the lagoon. About a week before this I heard two there and also two short-bills. As I was paddling up river and nearing the landing at Ball's Hill on the evening of the 17th, a woodcock skimmed low over me, crossing the river and apparently dropping into the marsh on the Bedford side. That same evening a whippoorwill sang a few notes near the stone boat-house."

Well, the morsels for a taste have turned out to be something approaching a feast and have undoubtedly carried you readers into the fine print of continuation pages, but I ask where I could have stopped, and wonder if you can stop even here. After all, *October Farm* is a good-sized book.

### Wilderness Trail Book

Deep-river Jim, as he calls himself, has put out a small book that is a sort of supplement to the *Open Road For Boys Magazine*. Its 320 pages, which include a good index, are crowded with stories about outdoor creatures, and how to learn more about them. Camping, tramping, cooking, tracks and tracking, and about a thousand other things of the outdoors are described, and often illustrated. The articles are mainly arranged by months. Jim did not write all of them. There are some by other famous authors.

The attitude toward wild creatures is wholesome. Those who think that anything called vermin should be exterminated should read the cautionary chapter on this subject. Our only criticism is that the book gives a little too much encouragement to the hunting instinct. We know boys like this, for we were boys ourselves, long ago, but at that time there were more wild creatures and not so many boys. We hope that the boys of today will learn to spare some for the boys of tomorrow. Most of our species are vanishing, and Nature alone can restore vanishing species, man's forbearance being granted. We have watched them vanish, and we know. Somewhere in the book is a chapter on photography. A small camera will save a lot more birds and mammals than a big gun.

The fifty cents that any boy, of whatever age, sends to the Open Road Publishing Company, Dept. I, 729 Boylston St., Boston, Mass., will bring good returns.

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### Planting for Profit

More than 10,000 dogwood seedlings have been ordered from the State Forester of Mississippi for winter planting in the Forestry Commission's "Plant Dogwood—Beautify Roadsides at a Profit" project. State Forester Fred B. Merrill reports receipt of orders from large and small landowners, educational institutions and civic organizations. The outlined project calls for dogwood planting for the improvement of roadsides and public properties and to replenish the dogwood species, a valuable commercial wood. The State Forestry Commission, through a contract with a commercial concern, can supply one- and two-foot seedlings at $10.50 per thousand, and a leaflet has been prepared giving planting instructions and other information. Orders should be placed by Mississippians with the State Forester, Jackson, Mississippi.

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### Sesquicentennial

More than fifty cities throughout the country have already made plans for planting the floral figures "1787-1937" in their public parks to mark the sesquicentennial of the signing of the Constitution of the United States, following the suggestion of the United States Constitution Sesquicentennial Commission at Washington, D.C. Women's Clubs, Nature Clubs and everyone interested in taking part in the celebration can obtain complete information from the commission, 524 House Office Building, Washington.

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## An Interesting Battle

By Bruce A. Stewart

One day, not long ago, I was sitting on the ground watching two large anthills, situated about a foot apart. Each held a vast colony of ants. I had been watching them going about their work, which consisted of bringing bits of earth out of their underground village, for some time. Suddenly something moving along slowly, jerkily, in the grass caught my eye. I looked around and saw a small honey bee being pulled along through the grass by several ants. The ants were pulling the bee towards anthill A, as I shall call one ant village. The bee was dead, and the ants were having hard work getting their enormous load home. After much tugging and pushing they arrived at their hill, only to find that the bee was too large to get into the hole.

In the meantime things were beginning to happen over at anthill B, as I shall call the second anthill. One of these ants had gone over to anthill A and seen the ants of the rival colony trying to get their big kill into their hole. It had come back and communicated with the other ants to tell them about it. Now the whole colony was scurrying about very excitedly. They were to attack the other hill and take the bee. The ants over at hill A seemed to realize what was about to happen. They dug desperately, trying to make the hole large enough to drag the bee into it. Many ants came out and walked about the hill. I guessed that they were guards. I looked back over at hill B, and saw a great number of ants moving across toward hill A. The A guards swarmed about the bee, ready to protect it. The attackers arrived and a fierce but short battle followed. I got close and watched carefully. The ants took hold of each other with their front legs. The two ants would stay in this lock for about a minute. By this time one or the other would usually gain an advantage, such as one ant tiring, or the other losing a leg. Then the victorious ant would jump on the other's back and tear him to pieces. Once in a while the apparently defeated one would rally and beat the other but this seldom happened.

As I said before, the first clash was short. The attacking forces completely outnumbered the A guards. For this reason they overpowered them. Most of the guards were killed, but a few escaped down their hole. This left the bee unguarded. The attackers then jumped on the bee and started to drag it away. But they only got about two inches, for at that time a huge army of ants dashed out of A and attacked the army from B. The onrush was so sudden that at first B's army retreated. But they soon recovered themselves and with more ants coming from their hill, they soon were attacking again. Both hills were sending out great numbers of ants. They fought furiously. When two ants started fighting, they fought until one or the other was dead. When one ant would kill another, what was left of him would be dragged to the victorious one's hill.

The ants from B were slowly but surely winning the battle. They dragged the bee with them as they retreated. Within thirty minutes after the fight had started the bee was within seven inches of B's hill. Suddenly most of the A army stopped fighting and moved back a few inches. Then all at once about one third of A's army swept out in a wide circle around where the bee was and the battle raged on. The other two thirds continued a losing battle.

I carefully watched the ants that had left the main army of A. They swept around and suddenly attacked the B anthill. This attack was completely unexpected. The regular line of ants that had been going and coming from the scene of battle was stopped. Another battle started here, but it didn't last long. So many ants from hill B had gone to the main fight that it left too few to successfully defend the B anthill. So the attacking forces from A drove a lot of B's ants into their hole. They also killed many. Then the A ants attacked the B ants in the main fight from the rear. A still more desperate fight followed in which the ants from A rallied and began driving their enemy back. The A ants then completely subdued the B ants and drove them back into their hole.

The victorious ants of A walked back. Along with them they dragged the dead bee that had caused so much fighting. When they got the bee back to their hill they worked quite a while enlarging the hole. They also tore the bee to pieces and thus they managed to get the bee, a bit at a time, into their hole.

I had wondered if, when the ants from A reached B, they would enter the B hole, take prisoners, ant eggs and so forth, but they did not. The reason why they did not, I think, was because all the A ants wanted was the bee, which they had gotten.

The next day I returned to the place where the anthills were. I wondered if the ants would be fighting again. They were not. Normal life had been resumed except for the fact that some of the ants were carrying off dead ants killed in the battle.

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Editor's Note: The above story is sent to us by a young naturalist of twelve years. His careful observation and vivid description makes the story eminently worthy of publication.

## Visible Ultra Light Beyond the Violet

By Francis C. Nicholas

It is probable that many people with sensitive eyes have seen a shading of ochreous light beyond the violet in the arch of the rainbow. It is indistinct, only a suggestion of light different from the ordinary brightness of a clearing sky.

In western Mexico, and in the lower portions of southwestern Arizona, a peculiar atmospheric condition develops during the rainy season. Then the air is beautifully clear during portions of the day, particularly when the country becomes overheated to 120 degrees or more Farenheit, and all the air is saturated with transparent moisture. The sky is clear at such times, but the moisture develops a blueness in the sky that is unusual and to some extent weirdly spectacular. I have seen cloud banks coming up against an early afternoon sun, mountainous masses of the clearest azure blue slowly mounting up into the expanse of a more intense blue seen in the surrounding unclouded sky. Ordinarily, the sunlight on such clouds would be gold with shadings of pink and indistinct red. Under the peculiarity of a clear, heated atmosphere, supersaturated with transparent moisture, such clouds came up in shadings of the purest light azure blue.

On two occasions, when the atmosphere was heated and supersaturated with moisture, I have seen strikingly vivid rainbows appear in the transparent but intense blue of the sky, with not a cloud in sight. Such rainbows are not only of striking luminous beauty, they also afford unusual opportunities for observation. Two colors beyond the violet become visible; at least I saw them distinctly on two occasions. Next to the violet there was a narrow well-defined band of dull ochreous yellow. This band blended into another color which was different from any other; it might find a suggestive description in a comparison of colors, though words do not describe colors.

In attempting to describe this color some idea of it might be imparted by stating that as blue is to violet so is green to this color. A person who had never seen violet would naturally call it a shade of blue. Similarly the stranger color, which I distinctly saw on two occasions, might be spoken of as a pearl green, or a light shade of gray green, yet it was neither of these. The color nearest to it is that fugitive blending of subdued greenish light noticeable on some abalone shells, but most decidedly it is not the green which generally shades with the play of colors over the surface of such shells. It was more like the suggestion of green noticeable adjacent to areas of pearly iridescence.

The regions which permitted the observations above noted were in the hilltops west of the town of Nogales, Arizona, and from the interior plains of Sonora, Mexico, near a little town called Carbo. The time was during the recent revolutions in Mexico, the observations having been made while I was serving as Director of the International Red Cross, Spanish Division.

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## The Weaker Sex?

New strength to Kipling's theory that the female of the species is always a foe to be reckoned with has been added by Earl Huff, Ochoco National Forest ranger. Huff was hurrying home when an animal flashed across the road in front of his car, closely followed by a deer. He thought he had seen a fawn followed by its mother, but realized that the youngsters do not often lead the family procession.

Huff stopped his car and investigated. To his surprise, he found that the deer had treed a full-grown bobcat. At that moment the cat leaped clear of the small pine that the doe was facing and dashed off with the deer in hot pursuit. The angry doe pressed the cat so hard that he was treed again in less than a hundred yards. Doubtless the doe had a fawn nearby and was determined to clear the surrounding woods of enemies. Huff said he has known deer to chase dogs away from their fawns, but this was the first time he had seen one tree a wildcat, and, what is more, insist that he stay there.

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## Prehistoric Glyptodon Found

The fossil skeleton of a prehistoric South American animal known to science as *Eleutherocercus* has just been added to the paleontological exhibits at the Field Museum of Natural History, Chicago. The animal, armored like a modern battleship, was a member of the glyptodont family, armadillo-like creatures that ranged in South America from about forty million years ago down probably to the days of earliest man. The fossil remains were discovered by the Marshall Field Paleontological Expedition led by Elmer S. Riggs.

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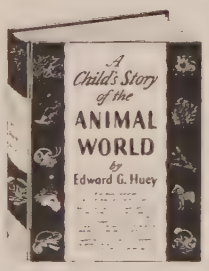


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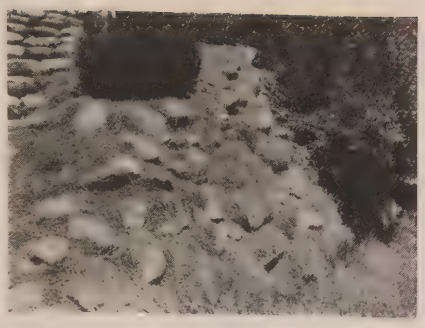


## Rock Plants Better for Terraces

Victor H. Ries

The bother and nuisance of seeding or sodding, and the mowing of banks and slopes, may be eliminated by planting them with creeping forms of rock plants.

Many banks and terraces, because of lack of moisture or poor soil, are difficult to keep covered with an adequate turf of grass.

Planting may be done almost any time after properly preparing and fertilizing the soil, but spring or early fall is preferable. If the soil is inclined to wash before the plants have an opportunity to grow and cover it, a light covering of straw spread over the surface will hold it.

A wide variety of plants is available for this type of planting. In general, those plants with a spreading habit of growth should be used. The steeper the bank and the greater the tendency to wash, the more vigorous should be the plant. Those that have a tendency to root along the stems, such as the thymes and many of the stonecrops, are preferable. On more gentle slopes less vigorous plants may be used.

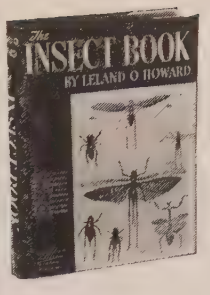
For banks facing the sun you will find snow-in-summer, moss pink, maiden pink, thyme, grass pink and dwarf speedwell, *Veronica rupestris*, may be used. Steep banks may be planted with periwinkle, *Vinca minor*; thyme, especially *Thymus serpyllum* and *Thymus citriodorus*; *Sedum spurium*, *Sedum album*; maiden pink, *Dianthus deltoides*; or *Ajuga*.

Shady banks may be planted with periwinkle, *Sedum ternatum*, *Ranunculus acris* or *Ajuga*. Some like to use an evergreen vine such as the English ivy when it is hardy, or a hardier vine, the winter creeper, *Euonymus radicans*, in its several varieties.

For hot dry banks the hardy prickly pear or cactus may be used to advantage. The cypress spurge, commonly found around old cemeteries, is equally tough and persistent.

## For the Persecuted

Raptores, the scientific name given to that group of predatory birds characterized by carnivorous habits, keenness of vision and great powers of flight, have long been hunted down by man, until many of the species are today threatened with extinction. At Pinnacles National Monument, California, a somewhat varied group of these birds of prey have found sanctuary along a series of rugged cliffs in an isolated and seldom visited part of the monument. Several sparrow hawks, red-tail hawks, a pair of prairie falcons, numerous turkey vultures, and a pair of duck hawks—long celebrated in story as peregrine falcons—have been noted. Scientists of the National Park Service attach much importance to this congregation of nesting raptorial birds and are extending them protection by setting aside the cliffs as a research area.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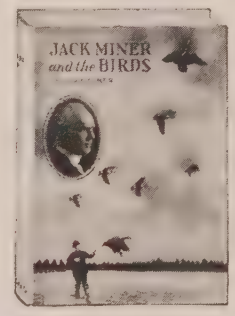


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## Squirrel Gratitude

By Viola Fisher Richards

In the autumn of 1935, during the period when squirrels were migrating in search of food, a friend of mine was on the Connecticut River in a boat driven by an outboard motor, when he saw a gray squirrel swimming across the river. He guided the boat near the swimmer and extended an oar, inviting the little animal to come aboard. Without hesitation the invitation was accepted, and after climbing up the oar, the squirrel ran around on the gunwale of the boat and seated itself on the bow. The man started the motor, intending to carry his passenger to the shore for which it had been headed, but the unfamiliar noise so frightened the squirrel it fell into the water.

Now when a squirrel swims, the tail is elevated high and dry above the water, but the plunge from the boat immersed this squirrel, and in its drenched condition it was having a difficult time to keep afloat, when its friend again came to its aid with an oar, and helped it aboard once more.

Profiting by past experience, the man refrained from starting the motor again, but, instead, manned the oars and navigated the boat with its precious passenger to shore. Then he bridged the gap between boat and shore with an oar, and the squirrel, comprehending the purpose, started to leave. As it passed the man, it paused long enough to touch its nose to his hand before scampering down the oar and out of sight on the river bank.

Was it mere curiosity that prompted this act? Why not think of it as an endeavor to express appreciation to its rescuer?

## Cleveland's Nature Trails

The Public Service Bureau of the Cleveland *Press* merits the praise of Cleveland's Nature lovers for the publication of *Cleveland's Nature Trails,* a printed booklet containing information about the abundant plant and animal life of the city's Metropolitan Parks. Dr. Arthur B. Williams, park naturalist of the Metropolitan Park System and ecologist of the Cleveland Museum of Natural History, supplied the articles and most of the photographs for the booklet and it is further illustrated by several excellent reproductions of color drawings of birds, flowers and trees of the region by Miss Lurabel Long of the Cleveland School of Art. In short, the pamphlet, which so far as we know is the first of its kind published by an American newspaper, is an authoritative guide book on the wildlife of the Cleveland area. This booklet deals primarily with spring, but it is planned to add additional ones covering summer, fall, and winter, thus making the complete set a year-around Nature guide.

The *Press* is to be congratulated for the work it has done in its effort to stimulate interest in the outdoors, and it is hoped other metropolitan newspapers will follow the excellent example set by this newspaper. The booklet is available for 10 cents, postpaid, from the offices of the *Press.*

## Proper Credit

In our booklet "Cookery in Camp and on the Trail" we published on page 21 a food list credited to Clinton C. Clarke. We find that this was originally drawn up by J. H. Hildebrand, vice-president of the Sierra Club, and published in the *Sierra Club Bulletin* for February 1933. It was sent to us without statement of its source and credit should go to Mr. Hildebrand.

## Bathing on the Wing

By Laura Miller

While I was watering the lawn one evening, one of the humming-birds that frequent my honeysuckle arbor flew up to me and poised above the spouting garden hose I held in my hand. He seemed attracted by the long black snake-like object and I wondered if the ornithologists could be wrong after all, and that snakes charmed birds. Surely, I thought, the bird imagined I held a snake in my hand. And yet, he seemed neither charmed nor frightened as he fluttered in the spray, just avoiding the full force of the water. It was a bath he wanted! He had been exposed to the heat and dust all day and here was his chance for a refreshing shower. To confirm this latter conjecture, I turned the hose first one way and then the other, and the bird followed, keeping himself in the gentle spray at the side of the nozzle. He was a ruby-throated hummingbird, and I could see the drops of water on his beautiful green and red feathers. If any of my readers have ever given a bath to a bird on the wing, they will appreciate the thrill I had. When he was satisfied he was thoroughly clean, he flew to the honeysuckle and had his supper, and I appreciated as never before the simple joys we have with the birds who claim our hospitality.

## The Odds Were Against Him

By Leonard S. Phillips

This is a story revealing the distrust some birds have for the Red-bellied woodpecker. A bird of this species was pointed out to me at my home one morning as he peered into the nesting cavity of a pair of downy woodpeckers in our English walnut. Sud denly a male downy appeared and began scolding vigorously, soon followed by a female, who also scolded at this intrusion of their privacy. In a short time, the vociferations of the downies attracted about 100 slate-colored juncos, several English sparrows, four goldfinches, a pair of cardinals, a pair of hairy woodpeckers, four tufted titmice and three white-breasted nuthatches, all of which flew to the nearby trees and eyed the intruder with suspicion. The flock dispersed after several moments, leaving only the downies to continue the one-sided argument. Finally, either bored by so much attention or frightened by such a display of reinforcements, the red-belly flew away, followed by one of the downies.

## Nature's Floral Menagerie

By George H. Bennett

There are many happy correlations in nomenclature between the animal and vegetal forms of life and the gems of verdant vales. For example, in your woodland rambles ponder well the attractive Adder-tongue, Fox-glove, Lark-spur, Hawk-weed, Hart's-tongue, Hen-bane, Tiger-lily, Toad-Flax, Goose-berry, Dog-fennel, Crow-foot, Lion's-tooth, Cat-nip, Pickerel-weed, Cow-slip, Ox-eye, Snake-flower, Butterfly-weed, Old Maid's Bonnet, Spider-wort, Turtle-head, Sow-thistle, Flea-bane, Crab-apple, Squirrel-Corn, Whippoorwill-shoe, Hare-bell, Lizard's-tail, Mouse-ear, Squaw-mint, Horse-chestnut, Hog-apple, Monkey-flower, Deer-berry, Stag-bush, Goat's-rue, Cuckoo-button, Lamb's-tongue, Pigeon-berry, Skunk-cabbage, Louse-wort, Witch-hazel, Shad dock, Crane's-bill, Bird's-nest, Calf-kill, and Devil's trumpet.

Nature's grand menagerie lies in God's great out-of-doors, awaiting all students enamored of its humor and mysteries. But always take along with you an open eye, a listening ear, and an appreciative mind. You'll never be disappointed.

## Variations in Mugho Pine

By Victor H. Ries

Those who are looking for a dwarf evergreen often choose the Mugho pine, and plant it with the expectation that it will be permanently dwarf. Sometimes this is so, but more often as the years go by the Mugho becomes taller and larger until it has outgrown its site.

This could have been prevented or at least postponed for many years by one of two things: the careful selection of a slow growing type when buying, or by yearly pruning. As indicated in the picture, there is a tremendous variation in the habits of growth of Mugho pines, since they are almost entirely grown from seed. Some grow almost ten times as fast as others, so that some, in ten years time, may be four or even six feet high.

If you desire a permanently small specimen, purchase one which grows not over two inches a year. On the other hand, if you desire a large specimen in a hurry and are not particular how large it gets, select one that shows a growth of four, or even six to eight inches a year. It is a simple matter to determine the year's growth by noting the distance between whorls of branches.

Although many gardeners will tell you it ruins an evergreen, especially a Mugho pine, to cut back the new growth, there is absolutely no truth in this statement if the pruning is properly done. Sometime in May or June, when the new growth is an inch or two in length, cut the tip off every branch with a knife or pruning shears, being careful to leave at least an inch of new growth on which new buds for next year's growth may develop. Occasionally, under good cultural conditions, buds may develop on the old wood; but as this cannot be depended upon, it is not advisable to cut off all the new growth.

In the same way, if the plant is growing too much on one side—cut this back and leave the rest alone. This same principle can be used on many different kinds of evergreens.

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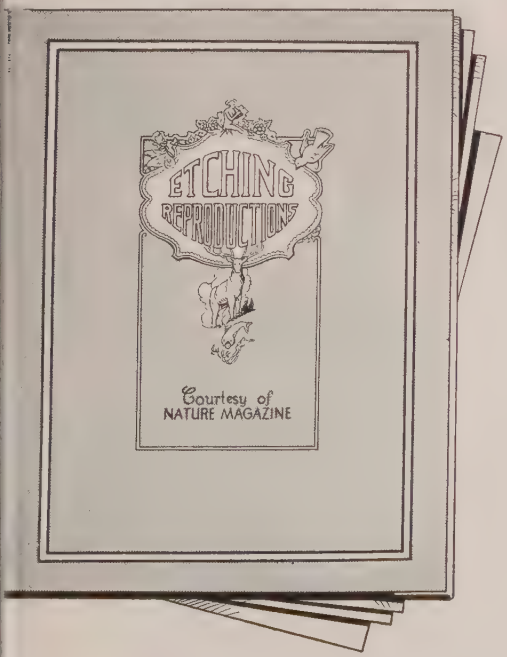


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# Photographic Notes

BY SAMUEL BROWN

## More About Enlarging

In response to many requests for more information on enlarging, we again devote this month's article to this fascinating phase of darkroom work. By means of the enlarger it is possible to change a picture from an ordinary snapshot to a real pictorial photograph. One of the means toward this end is a control known as *dodging*. While not especially difficult, the acquisition of skill in this medium depends a good deal on practice.

Before taking up the subject of dodging, there is a question which seems to trouble many of our readers. This is the choice of different papers for various subjects or types of pictures. As a rule, glossy papers should be avoided except when the prints are intended for reproduction. If enlargements are to be made from miniature negatives a rough paper is recommended, since this surface absorbs grain more than smooth ones. Absolute matte papers produce depth and make attractive portraits or architectural pictures. When in doubt, a good general paper is a semi-matte surface sometimes designated as *velvet*. For special purposes a *stipple* or *crystal* paper will make an attractive picture. Portraits with medium size heads or a group of figures are especially appropriate on these surfaces.

The choice of contrast for any particular negative is another important consideration in making an enlargement. Generally, enlarging paper is supplied in three degrees of contrast: soft, medium and hard. Negatives that have considerable contrast or a good deal of difference between their darkest and lightest portions should be printed on soft paper. Those negatives with a fair amount of difference and with many intermediate tones are best printed on normal paper while weak negatives with few tones will show up best on hard paper.

In dodging, one controls the amount of light that reaches the various parts of the enlarging paper. By this control it is possible to bring out detail in overexposed parts or to hold back weak parts of the negative while heavier ones print. Another important function of dodging is to hold back or print in portions to give a pictorial effect.

Most landscape negatives are overexposed in the sky or underexposed in the foreground. When such a negative is printed "straight" it is necessary to expose either for one or the other. Therefore, except in rare cases, both are rarely rendered accurately. By means of dodging a negative of this kind may be printed properly as follows: The negative is focused on the easel and the proper exposure for both parts is determined individually. This may be ten seconds for the foreground and twenty for the sky. When everything is in readiness an exposure of ten seconds is given for the whole print. A piece of cardboard is then quickly interposed between the easel and enlarger so that the shadow cast covers the foreground. The cardboard is then moved into the sky for a short distance and back to the horizon. This is done very quickly in a continuous motion back and forth for ten seconds thus giving the sky its full exposure. When the enlargement is developed it will be found to be exposed equally providing both exposures have been properly calculated. In cases where the horizon on the negative is not straight, a cardboard that follows the line of the horizon is prepared previous to exposure, and this may then be used to accomplish the dodging.

As a rule, pictures are much improved if they are darkened around the edges and in the corners. This tends to hold the eye in the main portion of the picture and serves as a border for the whole. To accomplish this, full exposure is given to the whole enlargement. A cardboard is then held between the easel and enlarger so that only one corner receives light. The cardboard is kept constantly in motion as described above and the same procedure followed for each corner. It is imperative that the cardboard be moved constantly so that there should be no definite line separating the controlled from the straight portions. In this way a naturalness is achieved that makes the picture more attractive.

The field of enlarging takes in many phases whereby it is possible to change the commonplace snapshot into a beautiful picture. From time to time this department will discuss these individual phases and the methods used in the various controls providing enough requests are received for articles of this type.

* * *

## Filters

(Continued from July)

Last month we discussed the spectrum, color sensitivity of different types of films and how it was possible to correct for the films' inherent oversensitivity to blue. The yellow filter is known as a correction filter. However, there are others which are used for specific purposes to give perfect renditions of all colors. An orthochromatic film, because it does not respond to red, cannot give full correction. In order to get perfect results it is necessary to use a fully color-sensitive emulsion such as one of the panchromatics.

Panchromatic films, though sensitive through the whole visible spectrum, are oversensitive to blue, not quite enough to green and slightly too much to red. A filter is needed to balance these incorrect values for perfect results. Since a green filter absorbs blue and red and freely passes green, a filter of this color will give perfect correction with panchromatic films.

Thus far we have considered filters from the point of view of daylight use. However, a new problem arises when photographing indoors under artificial light. Photoflood and photoflash lamps give a light that is rich in red rays. Since panchromatic films are slightly oversensitive to red to begin with, they give a much overcorrected rendition of this color in artificial light. This is especially apparent when making portraits because lips come out far too light. To offset this, it is necessary to use a deeper green filter tending toward blue that eliminates enough of the red rays to render it correctly. At the same time a filter of this type corrects for the blue and green the same as for daylight.

Due to the many filters on the market today and their various designations, there is much confusion as to what different filters are called. Almost any filter that is sold is reliable providing it is clearly colored, accurately ground and polished and the factors for the different films supplied with instructions for use. Some of the best known filters are Wratten, Lifa and Zeiss. These are supplied in all colors for full correction in daylight and artificial light. The yellow Wratten filters are K-1, K-2 and K-3; Lifa are Orthocolor 1, Orthocolor 2 and Orthocolor 3; Zeiss are G-1, G-2 and G-3. The 1's in every case are light yellow, the 2's medium yellow and the '3s, dark-yellow. Green filters are Wratten X-1, green for daylight and X-2 for artificial light; Lifa are Panchrom 1 light and Panchrom 2 dark for daylight and Panchrom 3 blue green for artificial light; Zeiss GR-5 light and GR-10 dark for daylight.

Factors for the above filters are shown in the table at the bottom of the page. More on filters next month.

* * *

## Trade Hints and New Books

*Graflex and Graphic Focal Plane Shutter Photography* is an excellent little booklet chock full of necessary information for the amateur photographer. Some of the important subjects covered are the correct use of stop openings and shutter speeds under various conditions, depth of focus with various focal length lenses and stops, point of view as regards sharpness, exposure charts and many more items of interest. Send a stamped, self-addressed envelope plus a two-cent stamp to this department for your copy.

| | ORTHOCHROMATIC | | PANCHROMATIC | |
|---|---|---|---|---|
| | DAYLIGHT | ARTIFICIAL | DAYLIGHT | ARTIFICIAL |
| K-1 | 2.5 | 2 | 1.5 | 1.5 |
| K-2 | 4 | 3 | 2 | 1.5 |
| K-3 | 7 | 4.5 | 2.3 | 1.7 |
| X-1 | 6 | 4 | 5 | 4 |
| X-2 | 7 | 5 | 6 | 5 |
| Orthocolor 1 | 2 | 1.7 | 1.5 | 1.3 |
| Orthocolor 2 | 3 | 2.5 | 2 | 1.6 |
| Orthocolor 3 | 5 | 4 | 3 | 2.5 |
| Panchrom 1 | 4 | 3 | 2 | 1.6 |
| Panchrom 2 | 6 | 4.5 | 3 | 2.5 |
| Panchrom 3 | — | — | — | 2.5 |
| G-1 | 2 | 1.6 | 1.4 | 1.2 |
| G-2 | 3 | 1.6 | 1.6 | 1.4 |
| G-3 | 5 | 2 | 2 | 1.5 |
| GR-5 | 4 | 3 | 2 | 1.5 |
| GR-10 | 7 | 5 | 3 | 2.5 |

Henry Herbert announces a new and nazing importation. The *Precisa* camera asts many remarkable features such as the odenstock high speed F. 2.9 lens, a shutter erating mechanically from one full second 1/150 of a second, a built in self timer d precision construction throughout. One the most attractive features is the optional ¼" x 2¼" or 2¼" x 2¼" size picture. sing the popular #120 or B-2 size film d taking 16 or 12 pictures on a roll, deending on the size picture taken, the camera well worth serious investigation. Interting literature is available from Henry erbert, 483 Fifth Ave., New York, N. Y. ease be sure to mention NATURE MAGAINE.

* * *

*Super Plenachrome* film, recently supied only in film packs, is now available roll film. Possessing great speed, higher itude and improved brilliance, this film ll prove a revelation under practically all nditions. Manufactured by the Agfa Ansco rp., Binghamton, N. Y., all dealers are w able to supply Super Plenachrome in ll film.

* * *

*The Model* by William Mortenson, Cam- Craft Publishing Co., 425 Bush St., San ancisco, Calif. Price $3.00.

Mr. Mortenson adds a new book to what quickly becoming known as the "Morson library." This new book takes up the estion of the model and discusses the ious details of posing parts of the body, stume, personality of the model and many re phases. Illustrated with many of Mr. rtenson's now famous pictures, *The odel* is doubly attractive yet practical from ery point of view. Different parts of the odel are individually posed to show right ll wrong ways of expression, costumes as rn by the model are discussed and many icate phases of Mortenson's system are aled. A necessary addition to your photophic library.

* * *

*Amateur Movies and How to Make Them* Alex Strasser, Studio Publications, 381 eth Ave., New York, N. Y. Price $3.50.

A good general book on amateur motion ture making has long been a necessity, d Mr. Strasser now fills this gap. The ateur movie maker will welcome this clear cise text that covers practically every ase encountered in this fascinating photraphic activity. Everything from the era through the actual making of carons, pictorial and personal films, cutting, ing, etc., is carefully covered. This book kes an excellent handbook for the owner a movie camera.

* * *

The photographic department of NATURE AGAZINE is devoted to its readers interest- in photography and maintains a service ich renders assistance with any photophic matter. You are invited to take adntage of this service. Address all photoaphic inquiries to Samuel Brown, NATURE AGAZINE, 1214 Sixteenth St., N. W., ashington, D. C.

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## Meet Our Authors

**W. Henricks Hodge** is an instructor in the Department of Botany at Massachusetts State College. Since he was a youngster, the study of natural history has been his avocation, and it is his desire, now that his hobby has crystalized into the teaching profession, "that it may be handed down a thousandfold in a lifetime for others to enjoy along with me."

**Uncas M. McGuire** is superintendent of Latham Public School, Latham, Missouri, where, in addition to other subjects, he teaches biology and grade science "injected with conservation." His hobbies, besides conservation, are ornithology and photography.

**Attilio Gatti**, who will be remembered for his article on the okapi that appeared in our July issue, favors us this month with another interesting adventure experience, concerning the capture of the bongo. Mr. Gatti, now on his tenth African expedition, has carried on photographic and collecting expeditions in behalf of several universities as well as the Royal Zoological Societies of Rome and Antwerp.

**N. R. Casillo**, outdoor writer, biologist and head of the Department of Biology, Senior High School, New Castle, Pennsylvania, bases his article on the many trips he has taken to the Pymatuning region, which is located a short distance from his home.

**E. E. Stanford**, Professor of Botany, College of the Pacific, San Francisco, California, is author of many botanical articles and several boy's books. His latest work is a college text entitled *General and Economic Botany*.

**Hadyn S. Pearson**, who says his hobby is conservation of natural resources, is principal of a junior high school in Newton, Massachusetts. He boasts of a 16-acre farm in West Mansfield, three acres of which he is developing into a bird sanctuary.

**Mrs. Marguerite L. Arnold** is a real Westerner. Her parents were married in Yellowstone Park in 1898, where her father has been in the Government service for more than forty years. After winning her B.S. degree at Montana State College in botany and bacteriology, Mrs. Arnold, then Miss Lindsley, came east long enough to earn her Master's degree at the University of Pennsylvania. Then it was back to Yellowstone, where, after holding down such positions as temporary ranger, permanent ranger and ranger naturalist, she married a permanent ranger in 1928 and began raising a brand new ranger in 1932.


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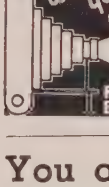

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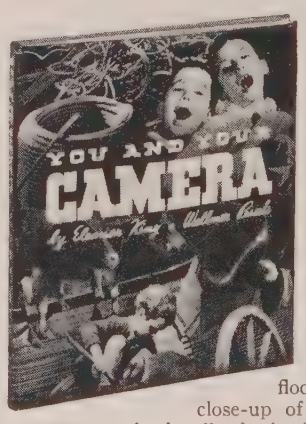
## You and Your Camera

Eleanor King and Wellmer Pessels

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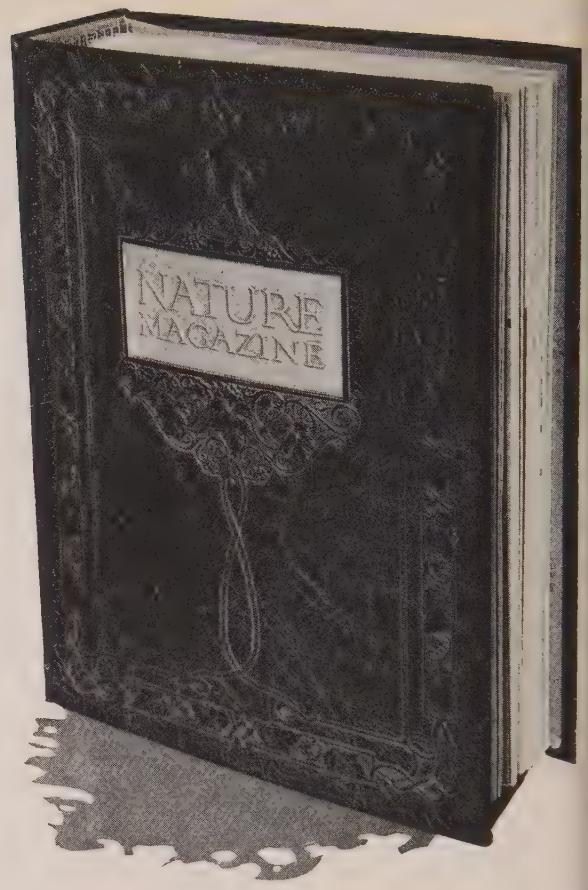


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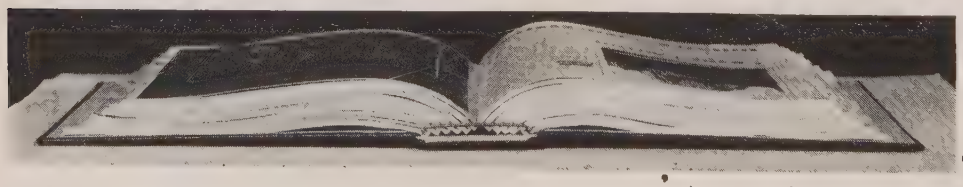

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## Hawaii's Turkey History

Ornithologists interested in the large number of wild turkeys that make their homes on the slopes of Mauna Loa, active Hawaiian volcano, believe these birds to be descendants of wild turkeys first brought to the islands in 1815 by Captain John Meek, master of the trading vessel *Enterprise.* The Hawaiian king's wife, never having seen the strange birds before, prevailed upon her husband to bring ashore several of them. It is believed that from them have descended the large numbers of turkeys that today roam the wastelands on the island of Hawaii.

## A Garden Party Game

By George A. Smith

The next time you have a party in your back yard garden, play this flower guessing game. It will entertain your friends and determine which one of your playmates has the best knowledge of flowers.

First, give each member of your party a piece of paper and pencil and tell them that a flower wedding has just occurred, in which Miss Mari Gold has become the bride of Mr. Jon Quil. The answers to the following questions must be answered with the names of flowers. The person answering the most questions correctly is the winner.

The answers written by the contestants should be numbered to correspond with the questions asked. Questions: 1. Whose seal was placed on the marriage license? 2. In what chapel was the ceremony performed? 3. What was the time of day? 4. What bells were rung? 5. Who was the preacher? 6. Who gave away the bride? 7. The bride wore a gown of what kind of lace? 8. What kind of gloves did she wear? 9. She carried a bouquet of what kind of blossoms? 10. What kind of breeches did the groom wear? 11. Who was the sweet maid of honor? 12. Name four of the bride's maids. 13. Who was the dandy best man? 14. What royal lady attended the wedding? 15. Who were the bachelors? 16. Who was the fat baby at the wedding? 17. How many people attended the wedding? 18. In what ball room was the wedding banquet held? 19. What kinds of lanterns were used to light the hall? 20. What was served at the banquet? 21. What was the flavor of the wine? 22. What kinds of shoes were thrown at the bridal couple? 23. What kind of corn was thrown? 24. How long will the marriage last?

Answers can be found on page 126.

EAGLES MERE, PA.

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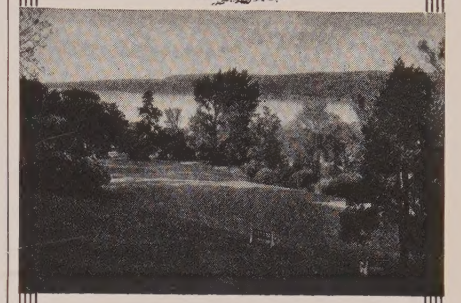

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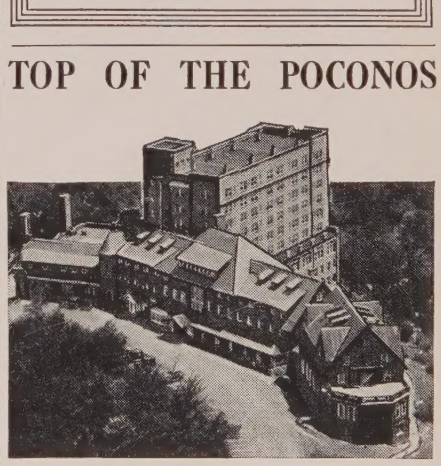

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# In August—Edith M. Thomas

*By* HOWARD ZAHNISER

IN A *Nature's Diary* compiled by Francis H. Allen and published forty years ago by Houghton, Mifflin and Company, I found some time ago that the entry for August 1 is an eloquent and lyric invitation to "come away to the 'slashing', where the Maryland yellow-throat warns the visitor with 'Witches here! Witches here!', where the geometric spider constructs her silken theorems on the largest scale, where poke and silkweed make prodigious growth, and where a not mystic Briareus holds out in his hundred scraggy hands a sweet and spicy lure;" and the invitation includes the philosophic comment that "in order to prize the blackberry at its full worth it must be wrested from the ogreish genius by single-handed contest."

The day's selection was attributed to a volume by Edith M. Thomas, entitled *The Round Year,* and I found also that for August 14 the compiler again drew on this book for a suggestion that we might have "more confidential relations with the Lake, more official knowledge, if we tried to get our living therefrom." As an example, it is pointed out that "the sandpiper has this advantage over us. He runs like a fly along the wet sand, his line of travel a series of scallops bounded by the coming and receding of the waves. Sometimes, 'for fun', he lets the water overtake and wash around his slender legs. He runs well, but cannot maintain a graceful standing position; for he seems to have the center of gravity misplaced, always nodding and swaying (tip-up, tee-ter), as though shaken by the wind, or troubled with a St. Vitus's dance."

I had never known that book, nor its author, but it occurred to me that a writer with such lyric expression, such a philosophy of enjoyment, and such a talent for vivid description must be one whose works would enrich one's reading experience. In *Nature's Diary* I noted also that Miss Thomas was a child of August, born on the 12th of the month in 1854, and I thought then that when it again came my turn to make some suggestions for August reading that I would look into this author's books. It was a good thought, and my enjoyment and evaluation of her writings make me an enthusiastic sponsor of Edith Thomas's books for your August browsings.

In *The Round Year* (published by Houghton, Mifflin in 1886), I spotted the sandpiper description in a delightful summer essay, "Along an Inland Beach", describing experiences along Lake Erie; and the invitation to the Maryland yellow-throat's slashings in an essay "In Praise of the Blackberry." With an eye for readings on August, I was in fact surprised to find that Miss Thomas had devoted such a large proportion of her pages to this hottest season of the whole round year. "A Summer Holinight" stands out in memory for its descriptions of night sounds; "The Solitary Bee" is summer reading; "Under the Sky" is an invitation to "lie down, some summer day, . . . with a soft grass pillow; then look around and above;" and "Mondamin" is in praise of Indian Corn, with the hint that "if the time be midsummer, I know not how they can entertain us better than to set before us dishes of boiled corn—ay, *sweet* corn, tender, milky—the full corn in the ear, requiring nothing more than the grace of a little salt." The entire volume seemed to me a thing of beauty that one surely would not willingly let die, for the author's intimate experiences and sensitive interpretations are recorded in a fine prose that is pleasant to read for its own sake.

Strangely enough, *The Round Year* was Edith Thomas's only volume of prose, for throughout her life she was first of all a poet, a poet of such spiritual quality and classic perfection that her audience has been small. Yet this audience ought to be wide, for her poems should be a lasting possession of all lovers of the out-of-doors. Fortunately, the year after her death (she died on September 13, 1925) a volume entitled *Selected Poems of Edith M. Thomas, Edited with a Memoir by Jessie B. Rittenhouse* was published by Harper and Bros.; and although many of her poems on birds, insects, flowers, and seasons published from time to time in thirteen volumes of verse are of course missing in her *Selected Poems,* this book, with *The Round Year,* deserves a place on your library shelves, or certainly in your recollections of good reading. The key to your interest is perhaps in the first lines of "Faithful Over a Few Things":

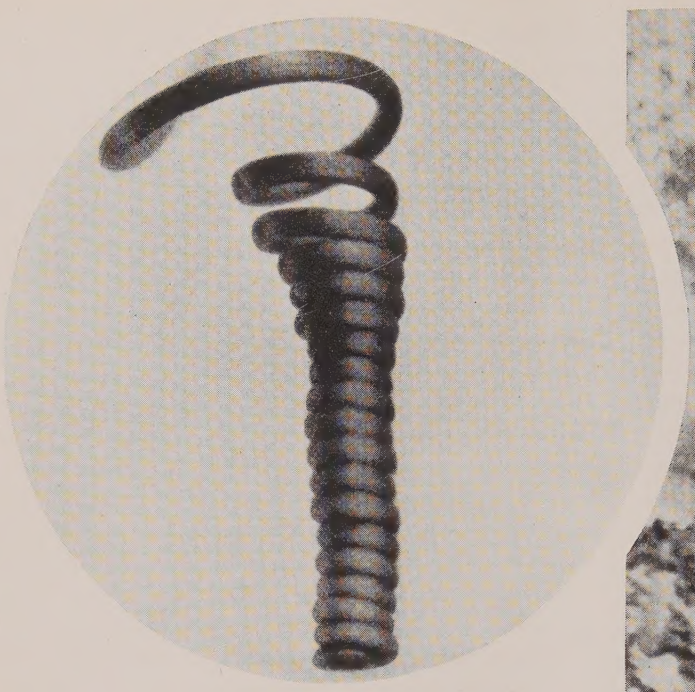
> All that was mine—I have loved it, and loved it both true and well.
> Quick to its call I uprose, as the heart to the sacring-bell.

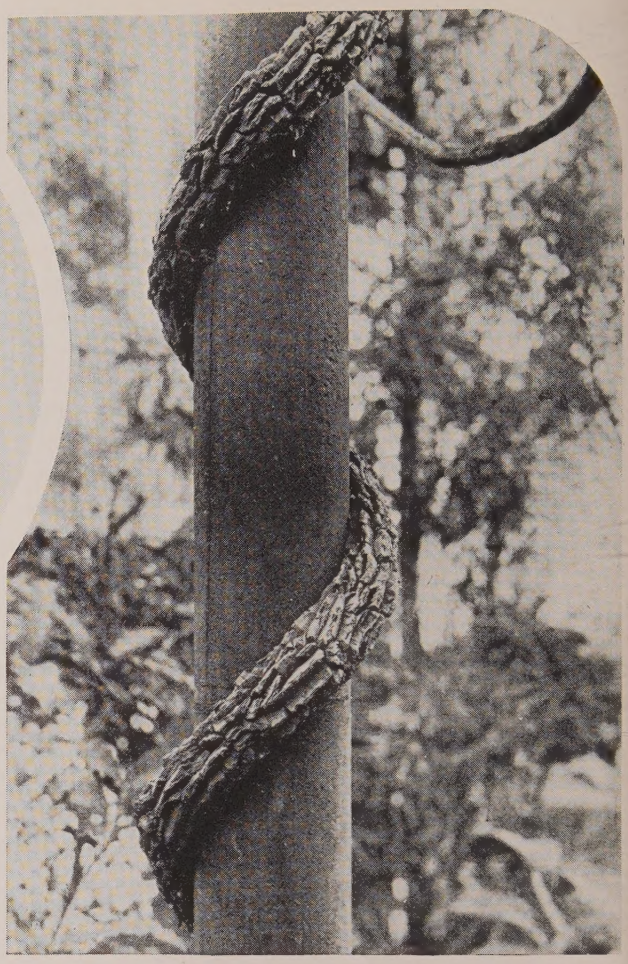
But, the main reason for your prizing her works with their lyric descriptions of outdoor things will be found in such samples as "The Grasshopper", beginning:

> Shuttle of the sunburnt grass,
> Fifer in the dun cuirass,
> . . . . . .

There is a useful sketch of Miss Thomas's life in the *American Dictionary of Biography* and a more intimate one in Jessie B. Rittenhouse's memoir in *Selected Poems.* The New York *Mail and Express* in the late '80's said one day that "a fragile woman with shadows under her eyes and ghosts looking out of them attracted some little attention standing in front of a florist's window. . . . None of the passers had ever seen quite such an embodiment of the pallid, the wistful, the spirituelle . . . large eyes, sad curves of the face, melancholy mouth." This is the poet and prose artist whose work I am commending for your August browsing, and with this seasonal interest in mind I am closing with the suggestion that it is interesting to note that the title poem of Edith Thomas's first volume *A New Year's Masque* includes a vision of the 12 months, and for August she wrote:

> I behold the firefly's lamp
> Waving in the thickest damp;
> Evening-primrose sudden bloom
> Mid the scented, sultry gloom;
> Flitting moths, with ruby eyes;
> Folded bees and butterflies.





CURLICUES AND SUCTION CUPS

Above, a single coiled tendril from the edible-fruited passion flower. At right, the cork-bearing coils of a tropical Dutchman's pipe, that, like the morning glory pictured below, is a sinistrorse or left-handed twiner. Our last picture is that of a Boston ivy, whose tiny flower clusters mature their fruits into adhesive discs, like the toe pads of tiny tree frogs